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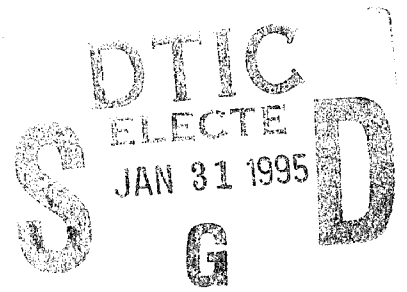
U.S. ARMY CHEMICAL AND BIOLOGICAL DEFENSE COMMAND

ERDEC-SP-025

**AFTER ACTION REPORT FOR THE SERVICE RESPONSE FORCE  
CONDUCTING OPERATION SAFE REMOVAL,  
5 JANUARY - 3 FEBRUARY 1993**

**DOCUMENTS AND REPORTS**

**VOLUME II: SPECIAL STAFF**



**Jeffery K. Smart**

**CORPORATE INFORMATION OFFICE**

**November 1994**

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Aberdeen Proving Ground, MD 21010-5423

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13. ABSTRACT (Maximum 200 words)  Operation Safe Removal was the designation for an emergency Service Response Force (SRF) mission at Spring Valley, Washington, DC. The SRF work was designated Phase I of the clean-up of the former American University Experiment Station site, designated a Formerly Used Defense Site by the U.S. Army Corps of Engineers. During Phase I, the SRF safely recovered and removed 144 WWI era munitions, some of which contained toxic chemical agents, from a residential construction site. This operation was accomplished with the complete approval of environmental officials, local and state officials, DoD officials, and local residents.				
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Special Staff

11. SUPPLEMENTARY NOTES (Continued)

\*\*When this study was conducted, the U.S. Army Chemical and  
Biological Defense Command was known as the U.S. Army Chemical  
and Biological Defense Agency.



## PREFACE

This work was started in January 1993 and completed in February 1993.

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## Acknowledgments

The author wishes to acknowledge each Service Response Force action officer who took the time to collect their documents and write their after action reports.

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AFTER ACTION REPORT FOR THE SERVICE RESPONSE FORCE  
CONDUCTING OPERATION SAFE REMOVAL, 5 JANUARY - 3 FEBRUARY 1993  
DOCUMENTS AND REPORTS

VOLUME II: SPECIAL STAFF

1. PURPOSE

a. Introduction and Background. The following paragraphs discuss an array of subjects concerning the Director of the Special Staff.

(1) Designee. COL Charles B. Kenison, MS, normally the Director of Risk Management for the Chemical and Biological Defense Agency.

(2) How Activated. Requested by name; directed to accompany the Service Response Force when it deployed on Sunday, 11 January 1993.

(3) Response Time Available. 26 hours were available.

(4) Protective Mask Available. I had my own mask because of my responsibilities with the Chemical and Biological Defense Agency.

(5) Working Position Title. Director of Special Staff.

(6) Point of Contact On Site. Upon arrival, I reported immediately to the Deputy, Service Response Force.

(7) Job Description. Synchronize the efforts of the legal, medical, safety, and environmental consultants.

(8) Arrival On Site. 1445, Sunday, 11 January 1993.

(9) On Site Work Location. Main HQ Building of the SRF.

(10) Chronology of Work. Please see Appendix II.

(11) Accomplishments Summary. As Director, I created a working environment in which the special staff was able to excel.

(12) Key Problems Solved. Please refer to the after action reports prepared by the members of my special staff.

(13) Key Problems Unresolved. Please see Appendix III.

(14) POV Requirements. Access to a government vehicle would suffice. The POV is desirable, but not essential.

(15) Equipment Requirements. Please see Appendix IV.

(16) Equipment Shortages. No critical shortages were incurred during the operation. However, please note Appendix IV which requests a FAX and Xerox for the special staff on future operations.

(17) Professional Preparation. I would have preferred to have attended the SRF course before deploying to Spring Valley.

(18) Additional Personnel. Recommend that the special staff be increased to include a medical service corps officer. If possible, that person should have an environmental background.

(19) When Deactivated. 2 February 1993 after the evening community meeting.

b. OBJECTIVES.

(1) Excellent Responsiveness. To be efficient and quick so the people we support get the answers they need when they need them!

(2) Constant Improvement. To never be "quite" satisfied with safety, medical, and environmental precautions.

2. OPERATIONAL SUMMARY. Please see the after action reports prepared by the members of my special staff.

3. OBSERVATIONS AND RECOMMENDATIONS.

a. Lessons Learned and Unresolved Problems. Please reference to Appendix III and the after action reports prepared by the members of my special staff.

b. Conclusion. The special staff was magnificent in responding to an unbelievable number of problems in a wide variety of professional arenas.

4. APPENDICES.

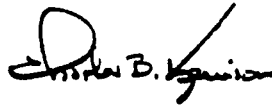
I. Verification Plan

II. Chronology of Work

III. Unresolved Problems

IV. List of Equipment to be provided by the SRF

V. List of Equipment to be brought by the Director



CHARLES B. KENISON  
COL, MS  
Director, Special Staff

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Appendix I

Verification Plan

Special Staff

Please see the plan which follows:



DEPARTMENT OF THE ARMY  
U.S. ARMY CHEMICAL AND BIOLOGICAL DEFENSE AGENCY  
ABERDEEN PROVING GROUND, MARYLAND 21010-5423



REPLY TO  
ATTENTION OF

COMMANDER, OPERATION SAFE REMOVAL SERVICE RESPONSE FORCE

14 Jan 1993

Operation Safe Removal  
Verification Plan for Termination of the Emergency Response Phase

1. SITUATION.

a. On 5 January 1993 while digging a trench to connect sewage to a new home, a commercial real estate developer discovered a cache of potentially hazardous explosive and chemical munitions at a formerly used defense site located in the Spring Valley section of Washington, D.C.

b. The Army responded by activating a Service Response Force (SRF) and developed a two phase operation plan to approach the situation.

c. The emergency response phase (Phase I) included removing, testing, packaging, and transporting potentially hazardous munitions from Spring Valley to safe storage locations for safe disposal.

d. The recovery/remediation phase (Phase II) is expected to be accomplished by the U.S. Army Corps of Engineers, Baltimore District and will consist of remedial operations to restore conditions at and in the vicinity of the site to an acceptable environmental state.

c. The purpose of this plan is to establish criteria for verifying termination of the emergency response phase and the beginning of the recovery/remediation phase.

d. Parties involved:

- (1) Service Response Force
- (2) Municipal Authorities of Washington, D.C.
- (3) Emergency Response Team of Region III, EPA
- (4) Baltimore District of the Corps of Engineers
- (5) U.S. Army Environmental Hygiene Agency
- (6) Technical Escort Unit
- (7) Roy F. Weston Environmental Consulting Firm.
- (8) Edgewood Research, Development, Engineering Center
- (9) Dept of Health and Human Services (HHS)
- (10) Dept of Labor Occupational Safety & Health Admin



2. MISSION. During the emergency response phase, the SRF is responsible for taking those actions necessary to control the site, reduce imminent risk, ensure health and safety, contain and render safe hazardous materials, protect the environment, and promote public confidence in the emergency response operations. Concurrent with removal actions, the SRF will obtain a representative body of reliable information to describe the risk and its effects on the environment.

a. Concept of Operations. The SRF personnel will take necessary actions to recover, package, and remove exposed potentially explosive or chemically hazardous munitions or debris. Monitoring personnel, by taking air, water, and soil samples, will collect, analyze, and report potential contamination information to assure safety of the recovery operations and to serve as the basis for verifying the absence of imminent risk.

b. Criteria for termination of the Emergency Response Phase. The emergency response phase will continue until the SRF Commander has determined that the threat of imminent risk has been eliminated. The following criteria, if met, will help to establish that the emergency response phase may be concluded when:

(1) All liquid or solid filled munitions and other objects or debris located in the suspected disposal pit which are also suspected to contain or be contaminated by chemical agents are removed, containerized, and rendered safe for transportation.

(2) All of the above liquid and solid filled munitions and material are removed from the Spring Valley residential area.

(3) The SRF Commander determines that the soil in, removed from, and immediately surrounding the excavated area poses no imminent risk of harm. At least 14 soil samples shall be taken and shall be tested for substances listed below. A determination that the soil poses no risk of imminent harm shall not be made unless test results reflect less than the following levels:

Mustard	0.06	mg/gram of soil
Lewisite	0.06	mg/gram of soil
Adamsite	2.6	mg/gram of soil
Arsenic	0.097	mg/gram of soil
Chloroacetophenone (CN)	1.57	mg/gram of soil
Cyanogen Chloride	3.12	mg/gram of soil
Chloropicrin	3.5	mg/gram of soil
Phosgene	2.07	mg/gram of soil
Mercury	1.6	mg/gram of soil
Lead	0.50	mg/gram of soil
Chromium VI	3.9	mg/gram of soil

(or to soil baseline level)

c. The Commander, Service Response Force and On Scene Coordinator will:

(1) Develop criteria for verifying the termination of the emergency phase.

(2) Complete the actions and conduct the sampling required.

(3) Determine, in coordination with local and federal agencies, when criteria have been met.

(4) Coordinate with the Baltimore District, Corps of Engineers to assure a smooth transition to Phase II.

d. The Deputy On-Scene Coordinator will:

(1) Coordinate the results with local and federal authorities to verify the absence of imminent risk.

(2) Host a transition information exchange meeting between key personnel from Phase I, Phase II, Federal, Civil and Local authorities prior to the conclusion of Phase I.

e. The Commander of the Baltimore District will:

(1) Be prepare to initiate Phase II activities.

(2) Coordinate with the Service Response Force to assure a smooth transition.

#### 4. SERVICE SUPPORT

a. The U.S. Army Environmental Hygiene Agency will evaluate the overall situation and develop a constituent list, maximum constituent level, and sampling strategy for verifying the absence of imminent risk in the soil.

b. The Emergency Response Team of EPA Region III will oversee the sampling program.

c. The Edgewood Research, Development and Engineering Center will conduct air space monitoring to assure the absence of chemical surety material and thereby protect laboratory employees from accidental exposure to chemical warfare agents.

d. The Edgewood Research, Development, and Engineering Center will conduct laboratory analysis for mustard, lewisite, and total arsenicals.

e. The U.S. Army Environmental Hygiene Agency will conduct laboratory analysis for chloroacetophenone, cyanogen chloride, chloropicrin, and phosgene. This laboratory will also conduct total metals and semivolatiles on approximately 20% of the samples.

f. Roy F. Weston Laboratories will conduct analysis for total metals and base, neutrals and acids (BNA) (equivalent to semivolatiles) in split samples which duplicate those cited in paragraphs d and e above.

g. The Service Response Force will provide the Baltimore District with the following:

- (1) A detailed list of recovered munitions.
- (2) The data acquired during soil sampling.
- (3) Fact sheets concerning the potential contaminants.
- (4) A roster of Spring Valley residents by name and address.
- (5) Copies of topographic and archeological products as required.
- (6) Other data as required.

##### 5. COMMAND AND CONTROL.

a. Management of the sampling program will be accomplished by the Service Response Force HQ during the emergency phase.

b. Management of subsequent sampling will be accomplished by the agency responsible for optimization of the remediation phase.

c. This action is being coordinated with Baltimore District, Corps of Engineers.



G. E. FRIEL

BG, USA

Commander

Service Response Force

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Appendix II

Chronology

Special Staff

Please see the pages which follow:

## DAILY PLAN

PLANS		NOTES	Expense / Mileage
5:30			
6:00			
6:15			
6:30			
6:45			
7:00			
7:15			
7:30			
7:45			
8:00	Special Staff Meeting		
8:15			
8:30			
8:45			
9:00	Called AEMA asking for Team to establish standards		
9:15	and sampling plan for verification of Phase I termination		
9:30			
9:45			
10:00	Begin development of GPR for intervention to Pin Bluff		
10:15			
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3:00	Talked with AEMA re: perspective concerning standards		
3:15	for verification termination of Phase I		
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4:45			
5:00	Special Staff Meeting		
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6:00	Talked with AEMA re: Dragnet Equipment for real time surveillance		
6:15			
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8:00	SRF Staff Meeting		
8:15	Asked AEMA to task AEMA to provide sampling plan		
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Mileage Log & Expense Recap		Planned Accomplishments	
Ending Mileage	Meals		
Begin Mileage	Transportation		
Total	Entertainment		
Tolls	Lodging		
Parking	Supplies		
Service	Misc		
Other	Cleaning		
Total	Total		

# DAILY PLAN

12

PLANS		NOTES	Expense Mileage
5	00		
6	15		
6	30		
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7	15		
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7	45		
8	00	Special Staff Meeting	
8	15	Called Andrews AFB concerning continuation of plans	
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11	15		
11	30	Called Andrews AFB concerning C-130 availability at 157m	
11	45		
12	00		
12	15		
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1	45		
2	00	Receiving technical recommendations for AETA (various plans)	
2	15		
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4	00		
4	15	Called Fort AP Hill to establish liaison with HQ	
4	30		
4	45		
5	00	Special Staff Meeting	
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8	00	SRF Staff Meeting	
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Mileage Log & Expense Recap		Planned Accomplishments	
Ending Mileage		Meals	
Beg. Mileage		Transportation	
Total		Entertainment	
Tolls		Lodging	
Parking		Supplies	
Service		Misc	
Other		Cleaning	
Total		Total	

# DAILY PLAN

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PLANS		NOTES	Expense Mileage
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# DAILY PLAN

PLANS		NOTES	Expense Mileage
5	30		
6	00 15 30 45		
7	00 15 30 45	Called LTC Nichols to obtain latest windows	
8	00 15 30 45	Special Staff Meeting	
9	00 15 30 45		
10	00 15 30 45	Received call from LTC Nichols to go	
11	00 15 30 45		
12	00 15 30 45		
1	00 15 30 45		
2	00 15 30 45		
3	00 15 30 45	Received EPA prerequisites from Kevin Koob for Hg, Pb, Cr, As	
4	00 15 30 45	Assisted in work instruction concerning Verification Plan	
5	00 15 30 45	Special Staff Meeting	
6	00 15 30 45		
7	00 15 30 45	Received call that C-23 was on the ground at Fiedstone	
8	00 15 30 45	Assisted in work instruction concerning Verification Plan	
9	00 15 30 45	Evening Staff Meeting	
5	TO	Completed work w/ SAC (LTC Williams) regarding criteria for formation of emergency plan	
Mileage Log & Expense Recap		Planned Accomplishments	
Ending Mileage		Meals	
Beg. Mileage		Transportation	
Total		Entertainment	
Tolls		Lodging	
Parking		Supplies	
Service		Misc.	
Other		Cleaning	
Total		Total	

# DAILY PLAN

PLANS		NOTES	Expense - Mileage
5	30		
6	00 15 30 45		
7	00 15 30 45	Called LTC Nichols to confirm no flight rights	
8	00 15 30 45	Talked Surgeon to get exact ref. breakdown products Special Staff Meeting	
9	00 15 30 45		
10	00 15 30 45	Interviewed w/ Mrs. Street	
11	00 15 30 45	Discuss records assessment with CIOs	
12	00 15 30 45	recommercial development of road assessment prior to rest of	
1	00 15 30 45		
2	00 15 30 45	Began drafting the sweeping plan	
3	00 15 30 45		
4	00 15 30 45		
5	00 15 30 45	Evening Special Staff Meeting	
6	00 15 30 45		
7	00 15 30 45	Interviewed w/ Mr. Richmond, Director of De Emergency Procedures concerning reimbursement	
8	00 15 30 45	Evening Staff Meeting	
9	TO		
5			

Mileage Log & Expense Recap		Planned Accomplishments	
Ending Mileage		Meals	
Beg. Mileage		Transportation	
Total		Entertainment	
Tolls		Lodging	
Parking		Supplies	
Service		Misc.	
Other		Cleaning	
Total		Total	

## DAILY PLAN

PLANS		NOTES		Expense Mileage
5	30			
6	00			
6	30			
6	45			
7	00			
7	15			
7	30	Finished first draft of Sampling Plan		
7	45			
8	00	Special Staff Meeting		
8	15			
8	30			
8	45			
9	00	Called CBIA CDO for assistance in releasing soil samples		
9	15			
9	30			
9	45			
10	00	Coordinated w/ Transportation and TAG re: movement of > 1 kg of sample		
10	15	Coordinated w/ LTC Britt and Tim Beldt re: release restrictions for sample		
10	30			
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2	00	Departure from Spring Valley		
2	15			
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3	30	Arrival at Edgewood		
3	45			
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Mileage Log & Expense Recap		Planned Accomplishments	
Ending Mileage		Meals	
Beg. Mileage		Transportation	
Total		Entertainment	
Tolls		Lodging	
Parking		Supplies	
Service		Misc.	
Other		Cleaning	
Total		Total	

# DAILY PLAN

PLANS		NOTES	Expense Mileage
5	30		
6	00 15 30 45		
7	00 15 30 45		
8	00 15 30 45	Meeting concerning criteria for termination of Plan I	
9	00 15 30 45		
10	00 15 30 45	Meeting of principal & S&F staff	
11	00 15 30 45		
12	00 15 30 45		
1	00 15 30 45		
2	00 15 30 45		
3	00 15 30 45	Meeting - discussing meeting / for SEDS	
4	00 15 30 45		
5	00 15 30 45		
6	00 15 30 45		
7	00 15 30 45		
8	00 15 30 45		
9	00 15 30 45		
5	TO		

Mileage Log & Expense Recap		Planned Accomplishments	
Ending Mileage		Meals	
Beg. Mileage		Transportation	
Total		Entertainment	
Tolls		Lodging	
Parking		Supplies	
Service		Misc.	
Other		Cleaning	
Total		Total	

# DAILY PLAN

PLANS		NOTES	EXPENSE Mileage
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1:00	Style Parameter Meeting	Mr. Porters	5/1
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# DAILY PLAN

PLANS		NOTES	Expense Mileage
5:30	Departed		
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8:00	Special Staff Meeting		
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3:00	Finalize 1st Draft of Summary Report		
3:15	Coordinate shipping info w/ AEA		
3:30			
3:45			
4:00	Check in to 7th and Redstone Roads		
4:15			
4:30			
4:45			
5:00	Special Staff Meeting		
5:15	Check in to 7th and Redstone Roads (703) 697-3510		
5:30	Provide Draft Summary Report to EPA		
5:45	Fax Draft Summary Report to AEA		
6:00			
6:15			
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7:00	Self Staff Meeting		
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Mileage Log & Expense Recap		Planned Accomplishments	
Ending Mileage		Meals	
Beg. Mileage		Transportation	
Total		Entertainment	
Tolls		Lodging	
Parking		Supplies	
Service		Misc.	
Other		Cleaning	
Total		Total	

# DAILY PLAN

PLANS		NOTES	Expense Mileage
5	30		
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6	15		
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	45		
7	00	Participation in briefing for GEN Ross	
	15		
	30	Special Staff Meeting	
	45		
9	00	Asked by WASH to prepare notice to residents	
	15		
	30	Added to Operations (Security)	
	45		
10	00		
	15		
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	45		
11	00		
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12	00		
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5	00	Special Staff Meeting	
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7	00	CRF Staff Meeting	
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Mileage Log & Expense Recap		Planned Accomplishments	
Ending Mileage		Meals	
Beg. Mileage		Transportation	
Total		Entertainment	
Tolls		Lodging	
Parking		Supplies	
Service		Misc.	
Other		Cleaning	
Total		Total	

# DAILY PLAN

PLANS		NOTES	Expense Mileage
5	00		
6	00 15 30 45		
7	00 15 30 45	Special Stg Meeting	
8	00 15 30 45		
9	00 15 30 45		
10	00 15 30 45	Discussed Lessons Learned w/ Field Study Team	
11	00 15 30 45		
12	00 15 30 45		
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3	00 15 30 45		
4	00 15 30 45		
5	00 15 30 45	Special Stg Meeting	
6	00 15 30 45	SRF Stg Meeting	
7	00 15 30 45		
8	00 15 30 45		
9	TO		
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Mileage Log & Expense Recap		Planned Accomplishments	
Ending Mileage		Meals	
Beg. Mileage		Transportation	
Total		Entertainment	
Tolls		Lodging	
Parking		Supplies	
Service		Misc.	
Other		Cleaning	
Total		Total	



# DAILY PLAN

PLANS		NOTES	Expense Mileage
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8:00	Special Staff Meeting		
8:15	Conducting Special Staff Meeting		
8:30	Consolidated w/ DDC briefing elevated BP/UB		
8:45	Attended meeting w/ ITT concerning phase II		
9:00	provided insight into constituent levels		
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4:00	Sent Fax to AEDA concerning sampling array		
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5:00	Special Staff Meeting		
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6:00	SRF Staff Meeting		
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# DAILY PLAN

PLANS		NOTES	Expense Mileage
5	30		
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6	15		
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7	00	Special Staff Meeting	
	15		
8	30	Visited pit to observe FEM operations	
	45		
9	00	Coordinated w/ COL Hughes of AP 4100	
	15		
	30		
	45		
10	00		
	15		
	30		
	45		
11	00	Coordinated with Maryland State EPA, and	
	15	APG 13A	
	30		
	45		
12	00	received tentative approval to ship samples to EA	
	15	(as they walked back to chopper)	
	30		
	45		
1	00		
	15		
	30		
	45		
2	00	Fax's "Suspect Munition" streamer to USA CRDA	
	15		
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5	00	Special Staff Meeting	
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7	00	SRF Staff Meeting	
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Mileage Log & Expense Recap		Planned Accomplishments	
Ending Mileage		Meals	
Begin. Mileage		Transportation	
Total		Entertainment	
Tolls		Lodging	
Parking		Supplies	
Service		Misc.	
Other		Cleaning	
Total		Total	

# DAILY PLAN

PLANS		NOTES	Expense Mileage
5:30			
6:00			
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7:00			
7:15	Special Staff Meeting		
7:30			
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8:30			
8:45			
9:00	Coordinate w/ Col Hughes / AP Hill re: 3 round trip		
9:15			
9:30			
9:45			
10:00	Begin Col Rand phone: change to 3 round trip		
10:15	Confirm Col w/ Virginia at Felted EPS of 3 round trip		
10:30			
10:45			
11:00			
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3:00	Received call from AP Hill acknowledge VA approval		
3:15			
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5:00	Special Staff Meeting		
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7:00	SRE Staff Meeting		
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Mileage Log & Expense Recap		Planned Accomplishments
Ending Mileage	Meals	
Beg. Mileage	Transportation	
Total	Entertainment	
Tolls	Lodging	
Parking	Supplies	
Service	Misc.	
Other	Cleaning	
Total	Total	

# DAILY PLAN

PLANS		NOTES	Expense Mileage
5	30		
6	00 15 30 45		
7	00 15 30 45	Special Staff Meeting	
8	00 15 30 45	Called CDR AP Hill re: ETA of O rounds Coordinated w/ Tim Benge to expedite AP Hill samples	
9	00 15 30 45	Coordinated w/ AFSA to expedite AP Hill sample	
10	00 15 30 45		
11	00 15 30 45		
12	00 15 30 45	Sat with CDR AP Hill re: Newspaper Article of the US Army blowing "mustard" at AP Hill linked him with the PBO	
1	00 15 30 45		
2	00 15 30 45		
3	00 15 30 45	Received feedback from AFSA concerning route the clock analysis of AP Hill soil samples	
4	00 15 30 45		
5	00 15 30 45	Special Staff Meeting	
6	00 15 30 45		
7	00 15 30 45	Self Staff Meeting	
8	00 15 30 45		
9	TO	Coordinated with AFSA concerning meeting samples	

Mileage Log & Expense Recap		Planned Accomplishments	
Ending Mileage		Meals	
Beg. Mileage		Transportation	
Total		Entertainment	
Tolls		Lodging	
Parking		Supplies	
Service		Misc.	
Other		Cleaning	
Total		Total	

# DAILY PLAN

PLANS		NOTES	Expense Mileage
5	30		
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6	15		
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7	15		
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	45		
8	00	Took missing samples to ACHA	
	15		
	30		
	45		
9	00		
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11	00		
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12	00		
	15		
	30		
	45		
1	00	Participated in Solid Round appointment < added	
	15	Pin Day ADK	
	30		
	45		
2	00	EPA Representative recommended withing side 5...	
	15	... passed info to Mr. B...	
	30		
	45		
3	00		
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4	00		
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5	00	Special Mtg Meeting	
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6	00	Skf Syst. Meeting	
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Mileage Log & Expense Recap		Planned Accomplishments	
Ending Mileage		Meals	
Beg. Mileage		Transportation	
Total		Entertainment	
Tolls		Lodging	
Parking		Supplies	
Service		Misc.	
Other		Cleaning	
Total		Total	

# DAILY PLAN

PLANS		NOTES	Expense Mileage
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8	15	Ordering for Mr. Walker and his staff	
8	30		
8	45		
9	00		
9	15		
9	30		
9	45		
10	00	Transition Phase I/II Meeting w/ TM	
10	15	(Estimate District)	
10	30		
10	45		
11	00		
11	15		
11	30		
11	45		
12	00		
12	15	12:20 Chopper w/ 1st Sgt. and departed Spring Valley	
12	30		
12	45		
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1	45		
2	00	Fax postage to Dept. Virginia	
2	15	Called Mr. Ely requesting him to read the proposal	
2	30		
2	45		
3	00	Received Mr. Ely	
3	15		
3	30	Re FAX'd info postage to Mr. Ely	
3	45		
4	00		
4	15	Asst. Eps representative to support the April 10 ESD demonstration	
4	30		
4	45		
5	00	Looked materials over with Mr. Ely	
5	15		
5	30	Had a summary into to Mr. Ely (round by round summary)	
5	45		
6	00	Received information from Mr. Ely about the following	
6	15	5:1 things	
6	30		
6	45		
7	00	Identified winds as < 2.5 mph if other the northerly	
7	15		
7	30	1 hour before blast	
7	45		
8	00	Various report after blast	
8	15		
8	30	Sampling data (18 ft and 20 ft)	
8	45		
9	00	Unofficial report when 1st data is available	
9	15		
9	30		
9	45		

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Mileage Log & Expense Recap		Planned Accomplishments	
Ending Mileage		Meals	
Beg. Mileage		Transportation	
Total		Entertainment	
Tolls		Lodging	
Parking		Supplies	
Service		Misc.	
Other		Cleaning	
Total		Total	

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## DAILY PLAN

[illegible]



# DAILY PLAN

Called TEJ for explanation as to why an LT saw "smoke" as presumed  
during the detonation of AD still which was to be HE/FP only

Called TEJ concerning disappearance of yellow hose wash down  
which had been sitting at the black edge of the pit.

Health & Human Services Meeting/Briefing  
to discuss --  
medical plan  
safety plan  
termination of emergency phase

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## Appendix III

### Key Problems Unresolved

#### Special Staff

#### Major Delays in Shipping the Munitions from the Site

SITUATION: Regulatory agencies are reluctant to authorize shipment of chemical agents into their state. In addition, Commanders of military installations are reluctant to authorize shipment of chemical agents onto their installation. This creates a serious future potential for major delays in removing munitions from sites.

DISCUSSION: The reason for their reluctance is understandable. During all interactions with State Officials, it was apparent that they were genuinely concerned for their constituency and that the delays were caused by professional conscienciousness. The problem is that delays put local citizens at unnecessary risk. They also put recovery workers at unnecessary risk. Consider the following:

(1) It took longer than a week for Andrews Air Force Base to grant the Army permission for transshipment of recovered munitions from helicopters to C-23 aircraft for the flight to Pine Bluff.

(2) It took longer than a week for the State of Virginia to grant permission to detonate high explosive and white phosphorus munitions at Fort A.P. Hill, even though the ranges had been used for that purpose for years.

(3) The State of Maryland initially rejected the Army request to ship a few munitions to the Edgewood Research, Development, and Engineering Center for drilling to determine the nature of fills. Intervention by members of the Army Secretariat was necessary to win Maryland's approval.

(4) And although the State of Arkansas needed only 3 days to approve the shipment of recovered munitions to Pine Bluff Arsenal, a bill has since been submitted in that State legislature in an attempt to prohibit chemical agents from entering or passing through Arkansas in the future.

#### RECOMMENDATIONS:

(1) Seek Congressional approval to allow the SRF Commander to determine the safest destination for recovered munitions, thereby circumventing delays or denials by state regulatory agencies.

(2) When negotiating the above, tell Congress that the Army will adhere to state regulatory requirements within our capacity to do so under the emergency situation.

## Current Storage Installation May Become Unacceptable to Arkansas

1. SITUATION: The Army may not be allowed to ship recovered chemical munitions to Pine Bluff Arsenal.

2. DISCUSSION:

a. Reasons. There are two reasons why the Army should prepare to store recovered chemical munitions at the nearest installation rather than attempt to ship them to Pine Bluff Arsenal, as in the case of Spring Valley.

(1) ARKANSAS DENIAL. There is an indication that the State of Arkansas will refuse out-of-state chemical munitions in the future.

(2) RISK MANAGEMENT. The Army transportation and storage operation should put the fewest number of American people at risk. Although the aircraft used for the shipment of recovered munitions is reliable, the flight to Arkansas is in excess of 1,000 miles, thereby placing an unnecessary number of people at risk.

b. Constraints. There are two constraints that would have to be overcome for the Army to use the nearest installation:

(1) RIGOROUS SECURITY REQUIREMENTS. Current regulations, AR 190-59 and AR 50-6, require that recovered chemical munitions be provided the same security as stockpile munitions, even though no competent terrorist organization would want or need to abscond with munitions which had been buried for decades.

(2) RIGOROUS PERMITTING REQUIREMENTS. If no State agrees to accept shipment of recovered munitions, the Army will be forced to store the munitions in the state of discovery, probably at the nearest military installation. Current regulations in most States require that special permits be obtained for storage of hazardous wastes. Although the Army has authority for emergency storage at any installation, such storage would be limited to a period of 90 days. A potential legal problem will occur if a State refuses to grant a storage permit after the military installation submits its application.

3. RECOMMENDATIONS:

a. With respect to the rigorous security requirements, that AR 190-59 and AR 50-6 be modified, as appropriate, to establish sensible security requirements for recovered munitions.

b. With respect to rigorous permitting requirements, that The Judge Advocate General, prepare a legal position in anticipation of the future situation in which no States agree to accept shipment of recovered munitions, AND in which the nearest military installation is denied a permit for storage.

## Appendix IV

### Equipment for

### The Director of the Special Staff and His Staff, in general

to be supplied by

SRF  
(HQ Commandant)

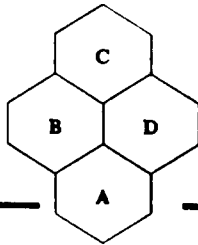
Table . . . . .	1
Chairs . . . . .	2
Phone . . . . .	1
FAX . . . . .	1
XEROX . . . . .	1

**Blank**

## Appendix V

### Equipment to be brought by The Director of the Special Staff for Himself

SRF Manual . . . . .	1
DA Pamphlet 50-6 . . . . .	1
Telephone directory with POC . .	1
Laptop computer . . . . .	1
Other references . . . . .	1



U.S. ARMY CHEMICAL AND BIOLOGICAL  
DEFENSE AGENCY  
ABERDEEN PROVING GROUND, MD

Plans and Contingency Operations Division  
Risk Management Office  
AMSCB-CMO

Telephone	DSN 584-2933	410-671-2933
Facsimile	DSN 584-4496	410-671-4496

FACSIMILE TRANSMISSION COVER SHEET

		Office Symbol	Office Telephone DSN/Comm		Fax No. DSN/Comm	
To: COL ENGLE		Δ AMO-SWS	D 227-6226		703 614-2675 703 693-9725	
Classification	Precedence	No. Pages (incl Header)	Date-Time	Month	Year	Receiver's Signature
U	R	2	021540	FEB	93	Boyd
Remarks						



4 Feb 93

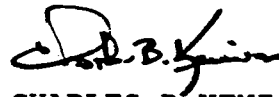
## MEMORANDUM FOR DAMO-SWS

SUBJECT: Initial Results of Sampling- WWI Munitions from Spring Valley

1. The following data represents initial results from drilling and sampling of the nine munitions transported to ERDEC from Spring Valley, District of Columbia:

<u>Sample #</u>	<u>Description</u>	<u>Content</u>
65	Livens Projectile	Water and metal salts
71	75mm Projectile	Fuming sulfuric Acid
82	75mm Projectile	Fuming sulfuric Acid
87	Livens Projectile	Water and metal salts
147	4.7in Projectile	Gun Cotton and Hydrocarbons (Probable Incendiary)
67	75mm Projectile	Thiodiglycol (TDG)
90	75mm Projectile	Mustard (60% purity)
113	75mm Projectile	Coffee colored liquid, some TDG
142	75mm Projectile	TDG

2. POC is Mr. Kenneth R. Boyd, 584-2933.



CHARLES B KENISON  
Colonel, MS  
Director, Risk Management

# ENVIRONMENTAL

## After Action Report

2 Feb 93

### 1. Purpose:

#### a. Introduction and Background.

(1) The CBDA environmental consultant first learned of the Spring Valley action on Wednesday, 6 Jan 93. During the evening hours of Thursday, 7 Jan 93, the CBDA environmental consultant was directed by the Dir, Risk Management, CBDA to report to the site on Friday, 8 Jan 93.

(2) The CBDA environmental consultant responded to the site with a gas mask and copies of federal and Maryland hazardous waste regulations. Additional materials were brought the following week and secured on-site.

(3) While on site, the CBDA environmental consultant served on the Special Staff and reported to COL Charles Kenison, Dir, Special Staff. The normal work location was the control center located at 5015 Warren Street.

#### b. Objectives. The following were the goals and objectives of the environmental section of the special staff:

(1) To coordinate environmental regulatory requirements with affected federal, state, and local regulators.

(2) To ensure regulatory requirements, such as emergency permits and notifications are met.

(3) To execute environmental requirements associated with movement of commodities such as arrangement for non-agent hazardous waste disposal, manifesting of rounds, etc.

### 2. Operational Summary:

#### a. General. Submitted EPA Form 8700-12 Notification of Hazardous Waste Activity

#### b. Liquid Filled/Suspect Agent Filled Rounds.

(1) Coordinated with Pine Bluff Arsenal Environmental Office to obtain requirements for Arkansas hazardous waste manifest.

(2) Determined EPA hazardous waste codes which may apply to rounds given list of possible fills.

(3) Obtained emergency transporter ID number from D.C. for Tech Escort Unit to transport hazardous waste.

(4) Prepared and processed hazardous waste manifest for three shipments to Pine Bluff Arsenal.

c. Solid Filled/Suspect HE Rounds

(1) Prepared information for emergency permit application and submitted to Ft. A.P. Hill who submitted the application to the State of Virginia.

(2) Coordinated information for manifest with environmental coordinator at Ft. A.P. Hill and experts at Va Dept of Waste Management.

(3) Prepared manifests and land ban certification for two shipments to Ft AP Hill.

(4) Submitted written information to VA for permit modification.

(5) Prepared after-action reports to VA following detonations at FT AP Hill.

d. Sample Rounds to ERDEC

(1) Assisted in preparation of fact sheet for State of Maryland re: proposed action.

(2) Coordinated fact sheet with APG and State of Maryland for approval of action.

(3) Provided information to staff personnel at ERDEC and guidance for review of SOP.

(4) Coordinated transfer of data on fill of rounds to MDE

(5) Provided disposition instructions for contents of rounds.

(6) Arranged site visit for MDE officials to foster continued support of efforts and request permission to ship additional rounds.

e. Miscellaneous Waste Disposal

(1) Made arrangements with the APGSA chemical waste disposal COR to have waste decon solution, scrap metal, disposal PPE, and contaminated soil disposed of under the existing contract at APG.

(2) Provided information for characterization of the waste streams.

(3) Served as on-site POC when wastes were removed.

### 3. Observations and Recommendations.

a. Lessons Learned and Unresolved Problems: (Please see the attached appendices which discuss lessons and problems in detail.)

b. Conclusion. This Service Response Force involved a lot of dedicated experts working long, hard hours to remove a threat of harm and to ensure the well being of the Spring Valley residents, the surrounding population, and the environment. The teamwork was tremendous. Accomplishments of monumental proportions were made in just four weeks. Environmentally, all the necessary permits, identification numbers, and approvals were obtained to allow the rounds to be transported and stored, analyzed, or destroyed in full compliance with the applicable environmental regulations. Under "normal" circumstances, it would have taken years to obtain the permits and approvals. Most of the regulators and environmental points of contact at other installations who were involved in this action were fully cooperative and also worked very hard to help us.


### 4. Appendices:

- A. Generator Information.
- B. Disposition of Suspect Agent Rounds.
- C. Disposition of Solid Filled, Suspect HE Rounds
- D. Samples taken to ERDEC
- E. Disposal of Miscellaneous Waste
- F. Soil Sampling Plan to Verify Termination of the Emergency Response Phase.
- G. Visit by MDE Officials
- H. Lessons Learned.
- I. List of Equipment
- J. Points of Contact.

# APPENDIX A - GENERATOR INFORMATION Operation Safe Removal

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Form Approved OMB No. 2030-0028, Expires 6-30-82  
EPA No. 0249-EPA-07

Please refer to the instructions for filing Notification before beginning this form. This information requested here is required by law (Section 307 of the Resource Conservation and Recovery Act).		 <b>Notification of Regulated Waste Activity</b> United States Environmental Protection Agency		Date Received (For Official Use Only)	
I. Installation's EPA ID Number (Mark "X" in the appropriate box)					
<input checked="" type="checkbox"/> A. First Notification		<input type="checkbox"/> B. Subsequent Notification (Provide RRM CI)		C. Installation's EPA ID Number: <b>DCP000001690</b>	
II. Name of Installation (Include company and specific site name): <b>OPERATION SAFE REMOVAL</b>					
III. Location of Installation (Physical address not P.O. Box or Route Number): Street: <b>5015 WARREN ST</b> Street (continued): City or Town: <b>WASHINGTON</b> State: <b>DC</b> ZIP Code: <b>20016-</b> County Code: County Name:					
IV. Installation Mailing Address (See Instructions): Street or P.O. Box: <b>ATTN: AMSCB-CG</b> City or Town: <b>APG</b> State: <b>MD</b> ZIP Code: <b>21010-5423</b>					
V. Installation Contact (Person to be contacted regarding waste activities at site): Name (Last): <b>KENISON</b> (First): <b>CHARLES</b> Job Title: <b>DIR, RISK MGMT</b> Phone Number (area code and number):					
VI. Installation Contact Address (See Instructions): A. Contact Address Location: <input checked="" type="checkbox"/> X B. Street or P.O. Box: <b>ATTN: AMSCB-</b> City or Town: <b>APG</b> State: <b>MD</b> ZIP Code: <b>21010-5423</b>					
VII. Ownership (See Instructions): A. Name of Installation's Legal Owner: <b>WC + AM MILLER COMPANIES</b> Street, P.O. Box, or Route Number: <b>4315 50th STREET NW</b> City or Town: <b>WASHINGTON</b> State: <b>DC</b> ZIP Code: <b>20016-</b> Phone Number (area code and number): <b>202-895-2700</b> B. Land Type: C. Owner Type: D. Change of Owner Indicator: (Date Changed) Month Day Year Yes No <input checked="" type="checkbox"/>					

1C - For Official Use Only

## VIII. Type of Regulated Waste Activity (Mark 'X' in the appropriate boxes. Refer to instructions.)

A. Hazardous Waste Activity		E. Used Oil Fuel Activities	
1. Generated (See instructions)	<input type="checkbox"/>	1. Off-Specification Used Oil Fuel	<input type="checkbox"/>
<input checked="" type="checkbox"/> A. Dryer (Less than 2,000 lbs.)	<input type="checkbox"/> 3. Transfer, Store, Dispose (at installation) Note: A permit is required for this activity; see instructions.	<input type="checkbox"/> a. Generator Marking to Burner	<input type="checkbox"/>
<input type="checkbox"/> B. 100 to 1,000 gpm (220 - 2,200 lbs.)	<input type="checkbox"/> 4. Hazardous Waste Fuel	<input type="checkbox"/> b. Other Markers	<input type="checkbox"/>
<input type="checkbox"/> C. Less than 100 gpm (220 lbs.)	<input type="checkbox"/> a. Generator Marking to Burner	<input type="checkbox"/> 3. Burner - Indicate device (if Type of Combustion Device)	<input type="checkbox"/>
<input checked="" type="checkbox"/> 2. Transfer (Indicate Markers in boxes 1-5 below)	<input type="checkbox"/> b. Other Markers	<input type="checkbox"/> 1. Utility Boiler	<input type="checkbox"/>
<input type="checkbox"/> a. For non-hazardous only	<input type="checkbox"/> c. Boiler and/or Industrial Furnace	<input type="checkbox"/> 2. Industrial Boiler	<input type="checkbox"/>
<input type="checkbox"/> b. For hazardous purposes	<input type="checkbox"/> 1. Smaller Quantity	<input type="checkbox"/> 3. Industrial Furnace	<input type="checkbox"/>
Mode of Transportation	<input type="checkbox"/> 2. Small Quantity Spillage	<input type="checkbox"/> 1. Specification Used Oil Fuel Markers (or On-site Burner) Who First Claims the Oil Meets the Specification	<input type="checkbox"/>
<input checked="" type="checkbox"/> 1. Air	Indicate Type of Combustion Device(s)		
<input type="checkbox"/> 2. Rail	<input type="checkbox"/> 1. Utility Boiler		
<input type="checkbox"/> 3. Highway	<input type="checkbox"/> 2. Industrial Boiler		
<input type="checkbox"/> 4. Water	<input type="checkbox"/> 3. Industrial Furnace		
<input type="checkbox"/> 5. Other - specify	<input type="checkbox"/> 5. Underground Injection Control		

## IX. Description of Regulated Wastes (Use additional sheets if necessary)

A. Characteristics of Nonlisted Hazardous Wastes. Mark 'X' in the boxes corresponding to the characteristic of nonlisted hazardous wastes your installation handles. (See 40 CFR Parts 261.20 - 261.24)

1. Ignitable (0001)	2. Corrosive (0002)	3. Reactive (0003)	4. Toxicity Characteristic (0000)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

USE SPECIFIC EPA HAZARDOUS WASTE NUMBERS for the Types (See instructions and examples)

D 0 0 4 D 0 0 8 D 0 0 7 D 0 1 1

B. Listed Hazardous Wastes. (See 40 CFR 261.31 - 33. See instructions if you need to list more than 12 waste codes.)

1 P 0 9 5	2	3	4	5	6
7	8	9	10	11	12

C. Other Wastes. (State or other wastes requiring a handler to have an I.D. number. See instructions.)

1	2	3	4	5	6
---	---	---	---	---	---

## X. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature

James L Bacon

Name and Official Title (type or print)

JAMES L BACON  
DEP OSC OAN SAFE REMOVAL

Date Signed

22 Jan 93

XI. Comments

Note: Mail completed form to the appropriate EPA Regional or State Office. (See Section III of the booklet for addresses.)

## APPENDIX B - DISPOSITION OF SUSPECT AGENT ROUNDS

### OPERATION SAFE REMOVAL

Subject: Disposition of Suspect Agent Filled Rounds

1. Situation: Recovered rounds which are suspected to contain agent are shipped to Pine Bluff Arsenal for storage pending final disposal.

#### 2. Environmental Regulatory Requirements:

a. Generator ID Number. An emergency generator identification number was issued verbally to Operation Safe Removal by the District of Columbia on 7 Jan 93. This action was requested by Kevin Koob, the Region III EPA on-scene coordinator. On 22 Jan 93, EPA Form 8700-12, Notification of Regulated Waste Activity, was submitted to the D.C. Government Hazardous Waste Management Branch, Environmental Regulation Administration as followup to the verbal request. (Note: Emergency Generator ID Number is DCP000001690)

b. Transporter ID Number. The suspect agent filled rounds were transported to Pine Bluff Arsenal via Army aircraft operated by Army pilots. A Technical Escort Unit (TEU) officer from Pine Bluff escorted each shipment. Since the hazardous waste manifest is an accountability document, the TEU was identified as the transporter on the manifest and the TEU escort officer signed the manifest. The District of Columbia authorized use of the generator id number as the transporter number for TEU to ship hazardous waste from the site.

c. Treatment, Storage, Disposal Facility (TSDF). The decision was made that suspect agent filled rounds would be sent to Pine Bluff Arsenal (PBA) for storage pending disposal. An existing PBA Part A RCRA permit for storage of M55 rockets was modified to allow storage of suspect agent filled rounds from Operation Safe Removal. The permit modification was approved on 12 Jan.

d. Arkansas Transportation Permit. The State of Arkansas requires anyone who transports hazardous waste within the state to obtain a special permit. The permit, PC-1412, was issued to PBA on 11 Jan 93.

e. Manifest. Kevin Koob, EPA, advised that the On-Scene Coordinator or Deputy On-Scene Coordinator at CERCLA site normally signs manifests as the generator. For Operation Safe Removal, Mr. James Bacon, Deputy On-Scene Coordinator, was designated to sign the manifests as the generator.

3. Designation of Rounds. All liquid filled rounds and rounds in which the fill melted when heated were considered suspect agent filled and are shipped to PBA. Solid filled rounds which show a chlorine signature on the Portable Isotopic Neutron Spectroscopy (PINS) were considered suspect agent and are shipped to PBA.



DEPARTMENT OF THE ARMY  
PINE BLUFF ARSENAL  
PINE BLUFF, ARKANSAS 71602-9500



REPLY TO  
ATTENTION OF

SMCPB-EM

12 January 1993

MEMORANDUM FOR On-Scene Commander for Operation Safe Removal

SUBJECT: Permit Modification at Pine Bluff Arsenal

1. The State of Arkansas has telephonically notified Pine Bluff Arsenal that the letter approving the modified storage for liquid filled items being removed at the Spring Valley site will be prepared today, 12 January 1993.
2. The State authorized the labeling and manifest preparation. However, shipment should be held until the letter is signed.
3. Pine Bluff Arsenal also received a permit, 11 Jan 93, authorizing the transportation of hazardous waste in the State of Arkansas by air only. A copy of the permit was faxed to you on 11 Jan 93.

WENDELL L. FORTNER  
Director/Environmental  
and Natural Resources  
Management

CF:  
Colonel Jackson



STATE OF ARKANSAS  
DEPARTMENT OF POLLUTION CONTROL AND ECOLOGY

8001 NATIONAL DRIVE, P.O. BOX 8913

LITTLE ROCK, ARKANSAS 72219-8913

PHONE: (501) 562-6533

FAX: (501) 562-2541

January 11, 1993

U. S. Army  
Pine Bluff Arsenal  
10020 Kabrich Circle  
ATTN: SMC PB-EM *wt*  
Pine Bluff, AR 71602-9500

Dear Sir:

The attached permit, PC-1412, is hereby issued for the purpose of transportation of hazardous waste in the State of Arkansas.

This permit is issued subject to the provisions of Act 406 of 1979, as amended, the rules and regulations of this Department, and the terms and conditions as herein set forth.

Sincerely,

*Vicky Prewett*

Vicky Prewett  
Program Coordinator  
Hazardous Waste Division

attachment

cc: Transporter files

ARKANSAS DEPARTMENT OF POLLUTION CONTROL AND ECOLOGY  
8001 National Drive  
P. O. Box 8913  
Little Rock, Arkansas 72219

HAZARDOUS WASTE TRANSPORTATION PERMIT

Pollution Control Permit Number: PC-1412      Date: January 11, 1993  
Arkansas Highway Police Permit Number: not applicable

TO: U. S. Army, Pine Bluff Arsenal  
10020 Kabrich Circle, ATTN: SMCPB-EM  
Pine Bluff, AR 71602-9500

This permit is issued for transportation of hazardous waste in the state of Arkansas as set forth in your application. This permit is issued subject to the provisions of Act 406 of 1979, as amended (Ark. Code Ann. 8-7-201 et seq.), the rules and regulations of this Department, and the following terms and conditions:

1. This permit shall automatically terminate on the anniversary date one (1) year after the date of issuance of this permit, unless terminated earlier by reason of noncompliance with the terms of this permit.
2. The vehicles and equipment used by permittee shall be operated by qualified personnel and maintained in good operating condition at all times.
3. Noncompliance with said Act 406 of 1979 and the regulations of this Department promulgated pursuant thereto is prohibited and will result in revocation of this permit and/or other appropriate enforcement action by the Department.
4. This permit is nontransferable and may be revoked or modified whenever it is necessary, in the opinion of the Department, to prevent or abate imminent hazard to the health of persons or to the environment.
5. Nothing herein contained shall be construed as releasing the permitted from any liability for damage to persons or property by reason of the maintenance or operation of the vehicles or equipment used by permittee in the transportation of hazardous waste.
6. This permit is issued in reliance upon the statements and representations made in the application and the plans and specifications and the Department has no responsibility for the adequacy or proper functioning of the vehicles and equipment described therein or used by permittee.
7. Condition: Air Transportation only.

Arkansas Department of Pollution Control and Ecology

by:   
Chief, Hazardous Waste Division



STATE OF ARKANSAS  
DEPARTMENT OF POLLUTION CONTROL AND ECOLOGY

8001 NATIONAL DRIVE, P.O. BOX 8913  
LITTLE ROCK, ARKANSAS 72219-8913  
PHONE: (501) 562-6533  
FAX: (501) 562-4631



Certified Mail  
P 805 079 003

January 12, 1993

Mr. Wandal Fortner  
Environmental Coordinator  
Pine Bluff Arsenal  
Pine Bluff, AR 71602-9500

RE: Part A Application  
AR0213820707

Dear Mr. Fortner:

The Department received the Part A application, dated January 8, 1993, for the addition of the following waste codes to the interim status M55 storage area:

<u>Waste Code</u>	<u>Material</u>
P095	Phosgene
D002	Corrosive
D005	Barium
D006	Cadmium
D007	Chromium
D008	Lead
D009	Mercury
D010	Selenium
D011	Silver

The Department determined the Part A application to be administratively complete. If during the permit processing, it is determined by the Department that additional information is needed, PBA would be required to submit the additional information. The Department understands a permit application modifications will be received within ninety (90) days to address receipt of off site discarded ammunition (both conventional and chemical-filled).

Thank you for your cooperation and if you have any questions, please do not hesitate to call.

Sincerely,

*Phillip Murphy*  
Phillip Murphy

Inspection Engineer II, Hazardous Waste Division

PM:cw PBWEN.112

cc: Mike Bates, HWD  
Jerry Williams, HWD  
Cindy Harmon, HWD  
Lowell Seaton, EPA

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved OMB No 2050-0039. Expires 9-30-94

<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA ID No. <b>DCEP0000011479-1-1001</b>		Manifest Document No. <b>of</b>		2. Page 1 Information in the shaded area is not required by Federal law					
3. Generator's Name and Mailing Address: <b>SERVICE RESPONSE FORCE - OPERATION SAFE REMOVAL 5015 WARREN ST WASHINGTON, DC 20016</b>				A. State Manifest Document Number <b>AR- 611927</b>							
4. Generator's Phone: <b>(1-800) 431-1236</b>				B. State Generator's ID							
5. Transporter 1 Company Name <b>U.S. ARMY TECHNICAL ESCORT UNIT</b>				6. US EPA ID Number <b>DCEP0000011479</b>		C. State Transporter's ID <b>PC 1712H</b>					
7. Transporter 2 Company Name				8. US EPA ID Number		D. Transporter's Phone					
9. Designated Facility Name and Site Address: <b>PINE BLUFF ARSENAL 10020 KAERICH CIRCLE, ATTN: SMCPE-EM PINE BLUFF, AR 71602-7500</b>				10. US EPA ID Number		E. State Transporter's ID <b>PC --- H ---</b>					
						F. Transporter's Phone					
						G. State Facility's ID					
						H. Facility's Phone <b>(501) 540-2819</b>					
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)  <b>a. WASTE AMMUNITION; TOXIC, 1.2 K; UN 0030</b>  <b>b.</b>  <b>c.</b>  <b>d.</b>				12. Containers		13. Total Quantity		14. Unit Wt/Vol		15. Waste No.	
				No.	Type						
J. Additional Descriptions for Materials Listed Above				K. Handling Codes for Wastes Listed Above		EMERGENCY RESPONSE INFORMATION:					
if no alternate TSDF, return to generator											
15. Special Handling Instructions and Additional Information: <b>THIS AMMUNITION MAY CONTAIN ANY OF VARIOUS CHEMICALS OF WHICH ONLY TRISODIUM IS A LISTED HAZARDOUS WASTE (RW). OTHER WASTE MATERIALS ARE LISTED BELOW. 24-HR EMERGENCY RESPONSE NAME + PHONE NO - FOR ALL STATES: (501) 540-2819 (DAVID GOODMAN)</b>											
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and Arkansas state regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.											
Printed/Typed Name <b>WALTER L. EASON</b>				Signature <i>[Signature]</i>				Month Day Year <b>11 11 93</b>			
17. Transporter 1 Acknowledgement of Receipt of Materials											
Printed/Typed Name <b>LIT LORAN L. CORRELL</b>				Signature <i>[Signature]</i>				Month Day Year <b>10 11 93</b>			
18. Transporter 2 Acknowledgement of Receipt of Materials											
Printed/Typed Name				Signature				Month Day Year			
19. Discrepancy Indication Space											
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19											
Printed/Typed Name				Signature				Month Day Year			

EPA Form 8700-22 (Rev. 9-88) Previous edition is obsolete.

**GENERATOR INITIAL COPY**



STATE OF ARKANSAS  
Department of Pollution Control and Ecology  
P. O. Box 8913 Little Rock, Arkansas 72219-8913  
Telephone 501-562-7444

6

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039. Expires 9-30-94

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No.		Manifest Document No.		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.			
3. Generator's Name and Mailing Address SERVICE RESPONSE FORCE-OPERATION SAFE REMOVAL 5015 WALKER ST WASHINGTON, D.C. 20016 ATTN: AMSCB-CC 4. Generator's Phone (501) 331-1229 4. Generator's US EPA ID Number AR-611920						A. State Manifest Document Number AR-611920					
5. Transporter 1 Company Name U.S. ARMY TECHNICAL SUPPORT UNIT 6. Transporter 1 US EPA ID Number AR-611920						C. State Transporter's ID PC 1412H					
7. Transporter 2 Company Name 8. Transporter 2 US EPA ID Number						D. Transporter's Phone E. State Transporter's ID F. Transporter's Phone					
9. Designated Facility Name and Site Address PINE BLUFF ARSENAL 10020 KABRICH CIRCLE, ATTN: SMC FB-EM PINE BLUFF, AR 71602-9500 10. Facility's US EPA ID Number AR-611920						G. State Facility's ID H. Facility's Phone (501) 540-2819					
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)						12. Containers		13. Total Quantity		14. Unit Wt/Vol	
a. WASTE AMMUNITION, TOXIC, 1.2K, UN0020						No. Type		Quantity		Waste No.	
b.						7 11 CW		1114812		P P095, D003, D003, D004, D005, D006, D007, D008, D009, D010, D011	
c.											
d.											
J. Additional Descriptions for Materials Listed Above						K. Handling Codes for Wastes Listed Above EMERGENCY RESPONSE INFORMATION:					
if no alternate TSDF, return to generator											
15. Special Handling Instructions and Additional Information THIS AMMUNITION MAY CONTAIN ANY OF VARIOUS CHEMICAL AGENTS OF WHICH ONLY PHOSGENE IS LISTED AS HAZARDOUS WASTE (P095). OTHER WASTE CODES WHICH MAY APPLY ARE LISTED ABOVE. 24 HR. EMERGENCY RESPONSE NAME & NUMBER - FALCON CENTER (501) 540-3700. DATED 4/1/81											
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and Arkansas state regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.											
Printed/Typed Name Signature Month Day Year											
17. Transporter 1 Acknowledgement of Receipt of Materials Printed/Typed Name Signature Month Day Year											
18. Transporter 2 Acknowledgement of Receipt of Materials Printed/Typed Name Signature Month Day Year											
19. Discrepancy Indication Space											
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19 Printed/Typed Name Signature Month Day Year											

EPA Form 8700-22 (Rev. 9-88) Previous edition is obsolete.

GENERATOR INITIAL COPY



STATE OF ARKANSAS  
Department of Pollution Control and Ecology  
P. O. Box 8913 Little Rock, Arkansas 72219-8913  
Telephone 501-562-7444

6

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved OMB No. 2050-0039 Expires 9-30-94

AR-9-92

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No D1C1P10101010116191014101013		Manifest Document No of 1		2. Page 1 Information in the shaded areas is not required by Federal law.	
3. Generator's Name and Mailing Address SERVICE RESPONSE FORCE-OPERATION SAFE REMOVAL 5015 WARREN ST. WASHINGTON, D.C. 20016 4. Generator's Phone (800) 331-1238				5. State Manifest Document Number AR- 611921		B. State Generator's ID	
5. Transporter 1 Company Name U.S. ARMY TECHNICAL ESCORT UNIT 6. US EPA ID Number D1C1A01010101161910				C. State Transporter's ID PC 1412H		D. Transporter's Phone	
7. Transporter 2 Company Name				8. US EPA ID Number		E. State Transporter's ID PC H	
9. Designated Facility Name and Site Address PINE BLUFF ARSENAL 10020 KAYBRICK CIRCLE, ATTN: SMLPB-EM PINE BLUFF, AR 71602-9500				10. US EPA ID Number 1AR01211382107017		G. State Facility's ID	
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)				12. Containers No. Type		13. Total Quantity Unit	
a. WASTE AMMUNITION, TOXIC, 1.2K, UN0020				77 CN		14. Unit Wt/Vol P	
b.						Waste No. D095, D002, D003, D004, D005, D006, D007, D008, D009, D010, OR D011	
c.							
d.							
J. Additional Descriptions for Materials Listed Above				K. Handling Codes for Wastes Listed Above EMERGENCY RESPONSE INFORMATION:			
if no alternate TSDF, return to generator							
15. Special Handling Instructions and Additional Information THIS AMMUNITION MAY CONTAIN ANY OF VARIOUS CHEMICAL AGENTS OF WHICH ONLY PHOSGENE IS A LISTED HAZARDOUS WASTE (PLAS). OTHER WASTE CODES WHICH MAY APPLY ARE LISTED ABOVE. 24HR. EMERGENCY RESPONSE NAME AND NUMBER-FBA OPERATIONS CENTER-501-541-2700. DAVID HILMAN							
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and Arkansas state regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.							
Printed/Typed Name JAMES L. BACON		Signature		Month Day Year			
17. Transporter 1 Acknowledgement of Receipt of Materials Printed/Typed Name SUSAN L. COVELL		Signature		Month Day Year			
18. Transporter 2 Acknowledgement of Receipt of Materials Printed/Typed Name		Signature		Month Day Year			
19. Discrepancy Indication Space							
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19 Printed/Typed Name				Signature		Month Day Year	

EPA Form 8700-22 (Rev. 9-88) Previous edition is obsolete.

GENERATOR INITIAL COPY

## APPENDIX C - DISPOSITION OF SOLID FILLED, SUSPECT HE/WP ROUNDS

### OPERATION SAFE REMOVAL

Subject: Disposition of Solid Filled, Suspect HE Rounds

1. Situation: Recovered rounds which are suspected to HE are shipped to Ft. AP Hill for detonation on an existing demolition range.

#### 2. Environmental Regulatory Requirements:

a. Generator ID Number. An emergency generator identification number was issued verbally to Operation Safe Removal by the District of Columbia on 7 Jan 93. This action was requested by Kevin Koob, the Region III EPA on-scene coordinator. On 22 Jan 93, EPA Form 8700-12, Notification of Regulated Waste Activity, was submitted to the D.C. Government Hazardous Waste Management Branch, Environmental Regulation Administration as followup to the verbal request. (Note: Emergency Generator ID Number is DCP000001690)

b. Transporter ID Number. The suspect HE rounds were transported to Ft. AP Hill via Army aircraft operated by Army pilots. Officers from the 67th EOD detachment stationed at Ft. McNair escorted each shipment. The 67th EOD already had a transporter identification number which allowed them to transport hazardous waste (id # DC8219921994).

c. Manifest. Virginia uses a standard EPA Uniform Hazardous Waste Manifest, EPA Form 8700-22. The manifest was completed for the shipment of hazardous waste projectiles and ammunition to Ft AP Hill for treatment. The items were identified by the hazardous waste codes D001 (ignitable) and D003 (reactive).

d. Treatment, Storage, Disposal Facility (TSDF). Ft AP Hill's interim status (Part A) permit for open detonation of waste explosives expired on 12 Nov 92 and they did not submit an application for a Part B permit. An application for an emergency permit was submitted to the State of Virginia on 13 Jan 93. The emergency permit was issued by Va on 20 Jan 93 and amended on 27 Jan 93 (id # VA2210020416). The permit expired 17 Feb 93.

#### 3. Permit Difficulties.

a. OSR provided information to Ft AP Hill for the emergency permit application on 13 Jan 93. The FT AP Hill environmental coordinator submitted the application to Virginia later that day. The information in the application reflected the status of the munitions as known at that point.

b. On Friday, 15 Jan 93, Va issued verbal interim approval of the application and an id number for use over the weekend, if necessary. No detonations were conducted for the next week due to higher priority actions and the desire to pack and ship all HE munitions at one time.

c. On Monday, 25 Jan 93, OSR contacted Ft. AP Hill who subsequently contacted VA requesting permission to sample 8 rounds to gain data to verify the PINS. Later, the decision was made to abandon the plan to try to get a sample and just to detonate 8 rounds and perform air and soil sampling to verify the absence of any chemical agent. Va regulators were concerned about our evaluation of the rounds and determined that a permit modification was required.

d. We provided information to Va explaining how the determination was made. On 27 Jan 93, Va issued a permit modification allowing us to detonate 8 rounds and requiring us to perform soil sampling after the detonation. The modification suspended the permit immediately upon completion of the detonation pending the state's review of the sampling data.

e. The detonation of 8 rounds was successfully completed on 27 Jan 93. Soil sampling data was provided to the state on 29 Jan 93. Later that day, they granted approval for treatment of the remaining items with certain restrictions.

f. The detonation of the remaining 90 rounds was performed successfully on 30 Jan 93.





# COMMONWEALTH of VIRGINIA

WILLIAM L. WOODFIN, JR.  
DIRECTOR

DEPARTMENT OF WASTE MANAGEMENT

JAN 20 1993

(804) 225-2887  
TDD (804) 371-8737

Ms. Terry Banks  
Department of the Army, Headquarters  
U. S. Army Garrison, Fort A. P. Hill  
AFKA-FHE-E  
Bowling Green, Virginia 22427-5000

Re: Temporary Emergency Permit

Dear Ms. Banks:

Enclosed please find a copy of the **TEMPORARY EMERGENCY PERMIT TO TREAT HAZARDOUS WASTES** issued to Fort A. P. Hill on January 15, 1992. The permit covers the treatment of the hazardous wastes designated in the permit.

Please be reminded that a copy of the report as described in the permit under the heading "Reporting" must be submitted within forty-five (45) days of the permit expiration or termination. The Department has determined that the permit application fee shall be waived.

Also enclosed is a Notification of Hazardous Waste Activity Form (8700-12). Please complete and submit this form to Stephen Turner of the Department for the above treatment action.

If you have any questions concerning this matter, please call me at (804) 786-6004.

Sincerely,

Garwin W. Eng  
Environmental Engineer Senior  
Office of Compliance and Enforcement

cc: Stephen Turner, VDWM

Enclosures

**HAZARDOUS WASTE MANAGEMENT PROGRAM**

**TEMPORARY EMERGENCY PERMIT**

**TO TREAT HAZARDOUS WASTES**

EPA Identification Number: VAP000007432  
Permit Issuance Date: January 20, 1993  
Permit Expiration Date: Completion of action described  
below or February 17, 1993

Issued by:

Department of Waste Management  
Office of Compliance and Enforcement  
11th Floor, Monroe Building  
101 North 14th Street  
Richmond, Virginia 23219

Authority:

Commonwealth of Virginia Hazardous Waste Management Regulations  
(VHWMR) §11.9. promulgated under the authority of Chapter 14,  
Title 10.1, Code of Virginia.

Name and Address of Permit Applicant:

Department of the Army  
Headquarters, U. S. Army Garrison, Ft. A. P. Hill  
Bowling Green, Virginia 22427-5000  
EPA ID Number: VA2210020416

Name and Address of Generator:

Operation Safe Removal - Spring Valley Munitions Recovery  
5015 Warren Street  
Washington, D.C. 20016

Location of Waste:

511 52nd Court, N.W.  
Washington, D.C.  
EPA ID Number: DCP000001690

Name, Location, and EPA ID Number of Facility:

Department of the Army  
Headquarters, U. S. Army Garrison, Ft. A. P. Hill  
Bowling Green, Virginia 22427-5000  
EPA ID Number: VA2210020416

Action Authorized:

Treatment of the waste described below will be by open detonation at Demo Site 77 in the Upper Zion Impact Area at the Facility (see Attachment I). The waste must be disposed of as quickly as possible to protect human health and the environment. The Facility is permitted to treat only the waste described below during the period specified by this Temporary Emergency Permit.

Description of Waste:

The wastes consist of old military munitions that are believed to have been buried during the 1910-1920 time frame. The munitions were unearthed January 5, 1993, from the Generator site. Based on available information, the munitions are thought to contain either explosive or white phosphorous material. Additional evaluation of the rounds will be conducted to confirm contents prior to shipment to the treatment Facility for destruction. The rounds recovered as of 6:00 p.m. on January 12, 1993 are as follows:

- 1 - 75 mm, fused
- 6 - 3" Stokes, fused
- 1 - 151 mm, unfused
- 19 - 75 mm, unfused
- 5 - grenades, unfused
- 2 - 4.7", unfused
- 3 - 4.7", (confirmed HE), unfused
- 2 - burster tubes

Excavation is continuing and additional rounds are expected to be found during the term of this permit. Such additional rounds that are similar in size and fill material as those described above are included within the scope of of this permit. The Facility will provide descriptions of any additional wastes found at the Generator site prior to treatment at the Facility.

Permit's Termination:

This permit may be terminated by the Department of Waste Management at any time without process if the determination is made that termination is appropriate to protect human health and the environment.

Permittee Standards with which Compliance is Required:

Effective Immediately:

VHWMR Part IX, Section 9.15.

VHWMR Part X, Sections 10.1., 10.2., and 10.3.

VHWMR Parts XI and XII

Ft. A. P. Hill Emergency Permit for Treatment  
Page 3

All residuals from treatment and contaminated soils must be managed as hazardous waste in accordance with VHWMR Part VI.

Procedure:

Although the treatment will be performed at Fort A. P. Hill, the treatment will be performed by the 67th Ordnance Detachment (EOD), U. S. Army, Fort McNair, Washington D.C. 20319-5050. The procedures contained in Attachment II of this permit must be followed during and after the treatment. If treatment results in any visible debris, it will be collected and removed for disposal in accordance with VHWMR Part VI.

Reporting:

Within 45 days of permit expiration or termination, the permittee shall submit to the Department a written report detailing the times, pertinent events, sampling and analytical data, and results of the permitted activity.

Reason for Issuance:

On January 5, 1993, a construction crew working a backhoe at the Generator site uncovered several munitions items. The Generator site had been used during WWI by the Research Division of the Chemical Warfare Service. Currently, the Army is taking action to expeditiously and safely remove the munitions and to assure proper disposition. Munitions will be recovered and evaluated on site to determine their sizes and contents. They are being stored on the Generator site pending transport by the 67th Ordnance Detachment (EOD), Fort McNair (Virginia H.W. Transporter # DC82100210049) to the Facility. Due to the location of the Generator site and the importance of removing the materials from the site as quickly as possible for disposal, the Director of the Department of Waste Management has determined that expedient action to protect human health and the environment is necessary.

Public Comment:

The Department of Waste Management solicits comments on the issuance of this permit. Written comments may be sent to, and copies of the permit may be obtained from, Connie M. Hill, Virginia Department of Waste Management, at the address provided on the first page of this permit. Although comments will not have an effect on the issuance of this permit, comments will be reviewed with respect to future emergency permits.

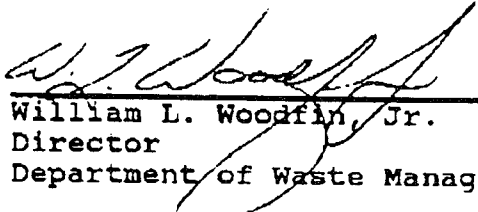
Ft. A. P. Hill Emergency Permit for Treatment  
Page 4

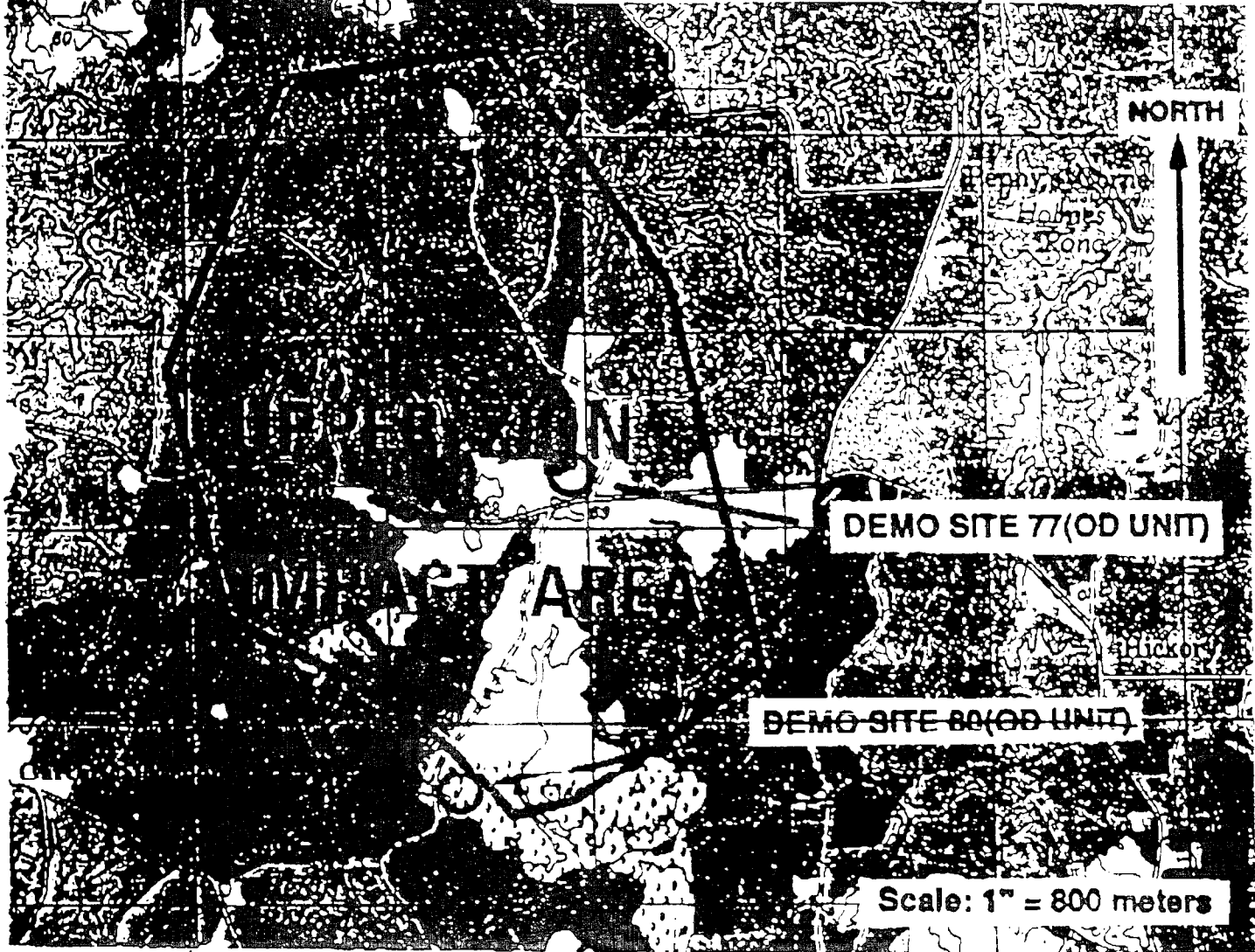
Emergency Occurrence:

In the event of an emergency occurrence outside the scope of this permit, contact Mr. John Ely at (804) 785-5764.

Date

1/20/93

  
\_\_\_\_\_  
William L. Woodfin, Jr.  
Director  
Department of Waste Management



## Site Location

60

ATTACHMENT II

DEPARTMENT OF THE ARMY  
67th Ordnance Detachment (EOD)  
FT Lesley J. McNair, Washington D.C. 20319

12 Jan 93

MEMORANDUM FOR Unit Personnel

SUBJECT: Standard Operating Procedures (Emergency Destruction Operation)

1. The purpose of this SOP is to provide unit and support personnel with the necessary safety guidelines for the destruction of items recovered during Operation Spring Valley.

2. REFERENCES:

- a. TM 9-1300-206
- b. TM 9-1300
- c. TM 60A-1-1-31
- d. FM 5-250
- e. TM 60A-1-1-22

3. RESPONSIBILITIES:

a. Senior EOD Team Leader is responsible for:

(1) Supervising all aspects of the Demolition operation at the Demo site.

(2) Insuring that personnel receive an Explosive Safety briefing before operation commences.

b. EOD Personnel: Are responsible for observing all safety standards, requirements, cautions as stated in this SOP, and in addition they will:

(1) Report to the Senior EOD Team Leader any unsafe condition, equipment, or material.

(2) Warn others who are endangered by known hazards or who fail to comply with safety precautions.

c. Support Personnel: Are responsible for following all directions given by EOD personnel. And will not leave the Demo area without checking out through the Senior EOD Team Leader present.

4. DEMOLITION OPERATION:

a. Prior to commencement of the operation a safety briefing will be held.

b. Upon completion of the briefing, the Senior EOD team Leader and support personnel will ensure that the Demo area is adequately prepared.

SUBJECT: Standard Operating Procedure (Emergency Destruction Operation)

c. The Demo operation will utilize existing Demo holes on Range 77, FT A.P. Hill. Each Demolition shot will be a minimum of 25 feet apart. There will be no more than seven (7) personnel down range at any time (including the NCOIC).

d. Safety Observer will be at least a minimum of 750 meters from the Demo site and will maintain visual contact and radio communications with the work party.

e. Communications will be maintained with the NCOIC and the Safety Observer at all times. The Safety Observer will maintain FM communications with Range Control, Freq. 32.00, during the entire operation.

f. Medical personnel will remain in the safe area and will respond to the directions of the Safety Observer.

5. EMERGENCY PROCEDURES:

a. In the event of an accident down range all operations will cease, and all tools and equipment will not be moved or removed from the site.

b. The Safety Observer will immediately notify Range Control that there has been an accident.

c. The Safety Observer will attempt to assess the situation from his location. He will also attempt to establish radio communications with the NCOIC. The Safety Observer will not allow anyone down range until the situation has been assessed and there is no scattered or burning High Explosives down range.

d. Medical personnel will be prepared to assist wounded personnel at the direction of the safety observer, and will not leave the safe area unless told to do so.

e. Personnel down range will evacuate to the safe area by means of the road and check out through the NCOIC or the Safety Observer.

*John T. Dlugak*  
JOHN T. DLUGAK  
CPT, OD  
Commanding



**ATTACHMENT 1**

I the undersigned have read and will comply with the Emergency Destruction Operation SOP.

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

Operation Safe Removal  
Spring Valley Munitions Recovery

INFORMATION PAPER

1. Situation. There is a need to verify the absence of agent before shipment of HE and WP munitions to Ft. A.P. Hill for disposal. It is believed that the current screening effort is highly effective at assuring the absence of agent, but it is desired to check several HE and WP munitions to be absolutely sure.

2. Background. The Cdr, Tech Escort Unit is continuing recovery and evaluation of rounds at Spring Valley. The fill in some items can be determined with a relatively high degree of certainty based on the type of round, its appearance, and x-rays. A new, state-of-the-art technology known as Portable Isotopic Neutron Spectroscopy (PINS) is being used to further define the fill in other rounds. Approval is being sought to sample some rounds to verify information provided by the PINS.

3. Classification of Rounds.

a. Initial evaluation. Recovered rounds are initially separated into two classes, liquid filled and solid filled.

b. Liquid. Liquid filled rounds are considered to be potential chemical agent and are shipped to Pine Bluff Arsenal.

c. Solid. Solid filled rounds may contain a variety of fills and additional work is performed to narrow down the list of possible fills.

i. Unknown solid filled rounds are warmed to a temperature where two chemical agents, mustard and bromobenzylcyanide, would melt. If the contents of such a round becomes liquid, the round is then reclassified as liquid filled, potentially agent.

ii. A representative sample of the remaining solid filled rounds is evaluated using the PINS. The objective of this evaluation is to separate rounds containing HE or WP from solid filled rounds containing other materials such as adamsite, lewisite, and chloroacetophenone. The PINS can readily detect chlorine atoms. Agent related solids including adamsite, lewisite, and chloroacetophenone from the WWI timeframe contain chlorine. If chlorine is detected by the PINS, the round will be considered potential agent and sent to Pine Bluff.

Operation Safe Removal  
Spring Valley Munitions Recovery

iii. Plans are to attempt to obtain a sample of the fill in rounds identified by the PINS as not containing chlorine to confirm the absence of agent. The proposed action is to take such rounds to Ft. A.P. Hill and attempt to open a small hole using a shape charge. If this is successful, a sample will be taken and analyzed to confirm the absence of agent. If the round contains HE, it is possible that the shape charge will result in a high order detonation, resulting in complete destruction of the round. If this occurs, soil samples will be analyzed and the results compared to baseline data to confirm the absence of agent in the round. After confirmation, additional rounds in this class will be added to the group intended for destruction at Ft. AP Hill.

4. Disposition of Rounds.

a. Current plans are to send rounds which can be safely transported and which are known or suspected to contain chemical agent to Pine Bluff Arsenal for storage pending disposal. This includes liquid filled rounds, solids that melt when warmed, and solids that are shown by the PINS to contain chlorine.

b. Rounds which can be safely transported and definitively identified as white phosphorus (WP) or high explosive (HE) will be open detonated at Ft. AP Hill.

c. Unknown solid filled rounds which are later confirmed to be free of agent through PINS analysis and testing of a random sample will be open detonated at Ft. AP Hill.

5. The POC is Terry Mann. Phone at Spring Valley is 1-800-331-1238, Special Staff.

Operation Safe Removal  
Spring Valley Munitions Recovery

Supplemental Information for the Permit for Destruction of HE and  
WP Rounds at Ft. AP Hill

1. Situation. There is a need to dispose of rounds determined to be HE and WP filled which were recovered from the munitions recovery site at Spring Valley. It is believed that the current screening effort is highly effective at assuring the absence of agent.

2. Background. The Cdr, Tech Escort Unit is continuing recovery and evaluation of rounds at Spring Valley. The fill in many items can be determined with a very high degree of certainty based on the type of round, its appearance, x-rays, and a new, state-of-the-art technology known as Portable Isotopic Neutron Spectroscopy (PINS). Approval is being sought to treat (destroy) rounds determined to be HE or WP.

3. Classification of Rounds. This section describes the logic which leads to the determination that rounds proposed to be sent to Ft. AP Hill are HE or WP filled.

a. Initial evaluation. Recovered rounds are initially separated into two classes, liquid filled and solid filled.

b. Liquid. Liquid filled rounds are considered to be potential chemical agent and are shipped to Pine Bluff Arsenal.

c. Solid. Solid filled rounds may contain a variety of fills and additional work is performed to narrow down the list of possible fills. The list of possible fills was determined based on the chemicals known to be in existence during the WWI timeframe and in use by the Army at Camp American University. A historian on site at the Spring Valley has research available records to obtain this information.

i. Solid filled rounds are warmed to a temperature where two chemical agents, mustard and bromobenzylcyanide, would melt. If the contents of such a round becomes liquid, the round is then reclassified as liquid filled, potentially agent.

ii. The remaining solid filled rounds are evaluated using the PINS. The objective of this evaluation is to separate rounds containing HE or WP from solid filled rounds containing other materials such as adamsite, lewisite, and chloroacetophenone. The PINS can readily detect chlorine atoms. Agent related solids including adamsite, lewisite, and chloroacetophenone from the WWI timeframe contain chlorine. If chlorine is detected by the PINS,

Operation Safe Removal  
Spring Valley Munitions Recovery

the round will be considered potential agent and will not be sent to Ft. AP Hill, but will be sent to Pine Bluff Arsenal with the liquid filled rounds.

iii. Plans are to destroy the solid filled rounds with no chlorine signature at the demolition range at Ft AP Hill. The 67th EOD detachment will destroy the rounds in a manner which will totally consume the fill.

iv. In the highly unlikely event the round contained a military unique chemical, the detonation will destroy the molecules of the fill. The Army will conduct soil sampling of the area after the detonation. If the results show statistically higher levels of contaminants in the soil, the contamination will be defined and cleaned up.

4. Details about Rounds to AP Hill

a. Plans are to transport all HE and WP rounds to Ft. AP Hill via Army helicopter. Decon and monitoring teams will accompany the shipment.

b. The detonation will be performed by personnel of the 67th EOD. After the detonation, the monitoring team will monitor the area using an M18 kit. In the highly unlikely event anything is detected, the decon team will decon the area and re-monitor. When the monitoring is negative, the soil samples will be taken for analysis.

c. Rounds proposed to be sent on 26 Jan are 8 ea 75 mm projectiles. If detonation of the above 8 is conventional HE and WP as fully expected, additional rounds will be identified for shipment to Ft AP Hill later in the week.



GEORGE E. FRIEL

BG, USA

Commander,

Service Response Force

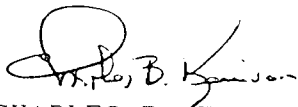
Operation Safe Removal  
Spring Valley Munitions Recovery

Supplemental Information (2) for the Permit for Destruction of HE  
and WP Rounds at Ft. AP Hill

1. Historical Search. In addition to the procedural screening steps referred to in the memorandum sent earlier today, it is appropriate to discuss the historical search which ruled out the possibility of any organophosphorous or dimethyl sulfide compounds in WWI rounds. Fortunately, such technology did not emerge until WWII or beyond.
2. Destruction/Dispersion. Explosive ordnance techniques assure sufficient temperature, over 3,000 degrees K, to guarantee molecular destruction of any chemical agent. Given the 2 mile buffer zone between the detonation site and the public domain, dispersion would guarantee no risk to the public.
3. Emergency Decontamination. In the highly unlikely event of agent contamination resulting from the detonation, emergency ordnance disposal personnel with special training and special equipment will be on hand as part of the disposal effort. They will accompany the munitions from Spring Valley to Ft. AP Hill.
4. Safety of Personnel on Site. All operators are EOD certified. Operations will be performed in accordance with Safety approved SOPs for demolition procedures. Implicit in those procedures are the calculations of standoff distances for the amount and configuration of explosive used to assure safety of personnel on site. Every individual participating will have a protective mask.
5. Hopefully the above will verify the precautions we will take to protect the people and environment of Virginia.

GEORGE E. FRIEL  
BG, USA  
Commander,  
Service Response Force

Official:



CHARLES B. Kenison  
COL, MS  
Dir, Special Staff



# COMMONWEALTH of VIRGINIA

VIRGINIA: WARDEN, JR.  
DIRECTOR

DEPARTMENT OF WASTE MANAGEMENT

(804) 786-547  
TDD (804) 786-547

Ms. Terry Banks  
Department of the Army, Headquarters  
U. S. Army Garrison, Fort A. P. Hill  
AFKA-FHE-E  
Bowling Green Virginia 22477-5000

Re: Temporary Emergency Permit

Dear Ms. Banks:

As you know, a TEMPORARY EMERGENCY PERMIT TO TREAT HAZARDOUS WASTE was issued to Fort A. P. Hill on January 20, 1993. However, the representatives of Operation Safe Removal have advised that the conditions under which that permit was issued have changed. After reviewing of the information provided in the January 25 and 26, 1993. facsimile transmittals, the Department has modified the emergency permit to accord with the telephone conversations of these dates.

The modified pages to be inserted into the permit are enclosed. Should you have any questions, please call Garwin W. Eng of my staff at (804) 786-6064.

Sincerely,

John E. Ely  
Office Director  
Office of Compliance and Enforcement

Enclosures

cc: Garwin W. Eng, VDMW  
Jack Schubert, VDAPC

JFE/gwe

Permittee Standards with which Compliance is Required:

Effective Immediately:

VHWMR Part IX, Section 9.15.

VHWMR Part X, Sections 10.1., 10.2., and 10.3.

VHWMR Parts XI and XII

All residuals from treatment and contaminated soils must be managed as hazardous waste in accordance with VHWMR Part VI.

Procedure:

Although the treatment will be performed at Fort A. P. Hill, the treatment will be performed by the 67th Ordnance Detachment (EOD), U. S. Army, Fort McNair, Washington D.C. 20319-5050. The procedures contained in Attachment II of this permit must be followed during and after the treatment. If treatment results in any visible debris, it will be collected and removed for disposal in accordance with VHWMR Part VI.

Reporting:

Within 45 days of permit expiration or termination, the permittee shall submit to the Department a written report detailing the times, pertinent events, sampling and analytical data, and results of the permitted activity.

(See Special Conditions for additional reporting requirements.)

Reason for Issuance:

On January 5, 1993, a construction crew working a backhoe at the Generator site uncovered several munitions items. The Generator site had been used during WWII by the Research Division of the Chemical Warfare Service. Currently, the Army is taking action to expeditiously and safely remove the munitions and to assure proper disposition. Munitions will be recovered and evaluated on site to determine their sizes and contents. They are being stored on the Generator site pending transport by the 67th Ordnance Detachment (EOD) Fort McNair (Virginia H.W. Transporter # DC82100210049) to the facility. Due to the location of the Generator site and the importance of removing the materials from the site as quickly as possible for disposal, the Director of the Department of Waste Management has determined that expedient action to protect human health and the environment is necessary.

Modified January 27, 1993



Special Conditions:

An initial shipment of eight 75 mm projectile rounds will be treated. The area will be monitored using an M18 kit. The Department must be verbally notified at least one hour prior to treatment and immediately after treatment of the initial shipment. The notification after treatment must also include a preliminary report of the M18 monitoring results.

According to the Generator, it has been determined with a high degree of confidence that the fill materials of the initial shipment are explosives. However, a contingency plan for detection and decontamination has been provided in the event that the fill materials are chemical weapons.

Within forty-eight (48) hours of treatment of the initial shipment, a written report documenting the treatment (including all sampling and analytical results) must be provided to the Department. Following treatment of the initial shipment, authorization for treatment of the remainder of the wastes described above (see Description of Wastes) is temporarily suspended. Approval for treatment of the remainder of the wastes will be considered after receipt and review of the written report.

Public Comments:

The Department of Waste Management solicits comments on the issuance of this permit. Written comments may be sent to, and copies of the permit may be obtained from, Garwin W. Eng, Virginia Department of Waste Management, at the address provided on the first page of this permit. Although comments will not have an effect on the issuance of this permit, comments will be reviewed with respect to future emergency permits.

Modified January 27, 1993

Operation Safe Removal  
Soil Sampling Plan for Ft A.P. Hill OD Range

1. Situation.

a. World War I munitions are being recovered from a site in Spring Valley, NW Washington, DC. They are being evaluated by various means in an attempt to identify the potential fill. Disposition of rounds is determined based on the potential fill.

b. Rounds identified as containing HE or WP will be detonated at Ft. AP Hill.

2. Purpose. Soil sampling is being performed to provide data to confirm the absence of any residual contamination from the detonation of rounds determined to be HE or WP.

3. Sample Management.

a. Sampling Pattern.

(1) Location. The location for placement of the rounds will be determined by 67th EOD personnel and will be marked with stakes. Samples will be taken from the center point and from North, East, South, and West points on concentric circles surrounding this center point as shown in figure 1.

(2) Number. A total of 4 samples will be taken; one from the center point and composites from circles 10, 20, and 30 feet from the center. Samples on a given circle will be combined into a composite sample.

(3) Frequency. Background samples will be taken once prior to the round detonation operation. Followup samples will be taken once after the detonation.

b. Sample Collection.

(1) Volume/Containerization. Soil samples shall be collected initially in 32 ounce glass jars from which they shall be then transferred to a plastic bag for mixing to assure homogeneity, from which they shall be transferred to two 8 ounce glass jars (which are teflon sealed) and two 40 ml VOA vials (which are teflon sealed) for transport to laboratories.

Operation Safe Removal  
Soil Sampling Plan for Ft A.P. Hill OD Range

(2) Preservatives. Samples require no special preservatives.

(3) Identification. Samples shall be identified and labelled as shown in table 1.

c. Sample Shipment. Samples will be sent to the Edgewood Research, Development, and Engineering Center and the U.S. Army Environmental Hygiene Agency for analysis. Split samples will also be sent to an EPA contract lab for verification of the Army analysis.

4. Analytical Management. The constituents measured by each laboratory shall be as follows:

a. Edgewood RD&E Center

1. Extractable arsenic
2. Total arsenic

b. U.S. Army Environmental Hygiene Agency

1. Choroacetophenone
2. Cyanogen chloride
3. Chloropicrin
4. Phosgene
5. Arsenic
6. Mercury
7. Lead
8. Chromium
9. Semivolatiles (BNA)
10. Other total metals

c. Verification by EPA Contract Lab

1. BNA (semivolatiles)
2. Total Metals

5. Data Evaluation. Levels of analytes shall be compared to the mean background concentrations using a one-tailed t test at the 95% confidence interval in accordance with the EPA guidance provided in Soil Sampling Quality Assurance User's Guide, 2ed. EPA 600/8-89/046.

Operation Safe Removal  
Soil Sampling Plan for Ft A.P. Hill OD Range

Table 1.

SAMPLE NUMBER	COMPOSITE OF
AP1	-
AP2	AP2A + AP2B + AP2C + AP2D
AP3	AP3A + AP3B + AP3C + AP3D
AP4	AP4A + AP4B + AP4C + AP4D
AP5	AP5A + AP5B + AP5C + AP5D
AP6	AP6A + AP6B + AP5C + AP6D

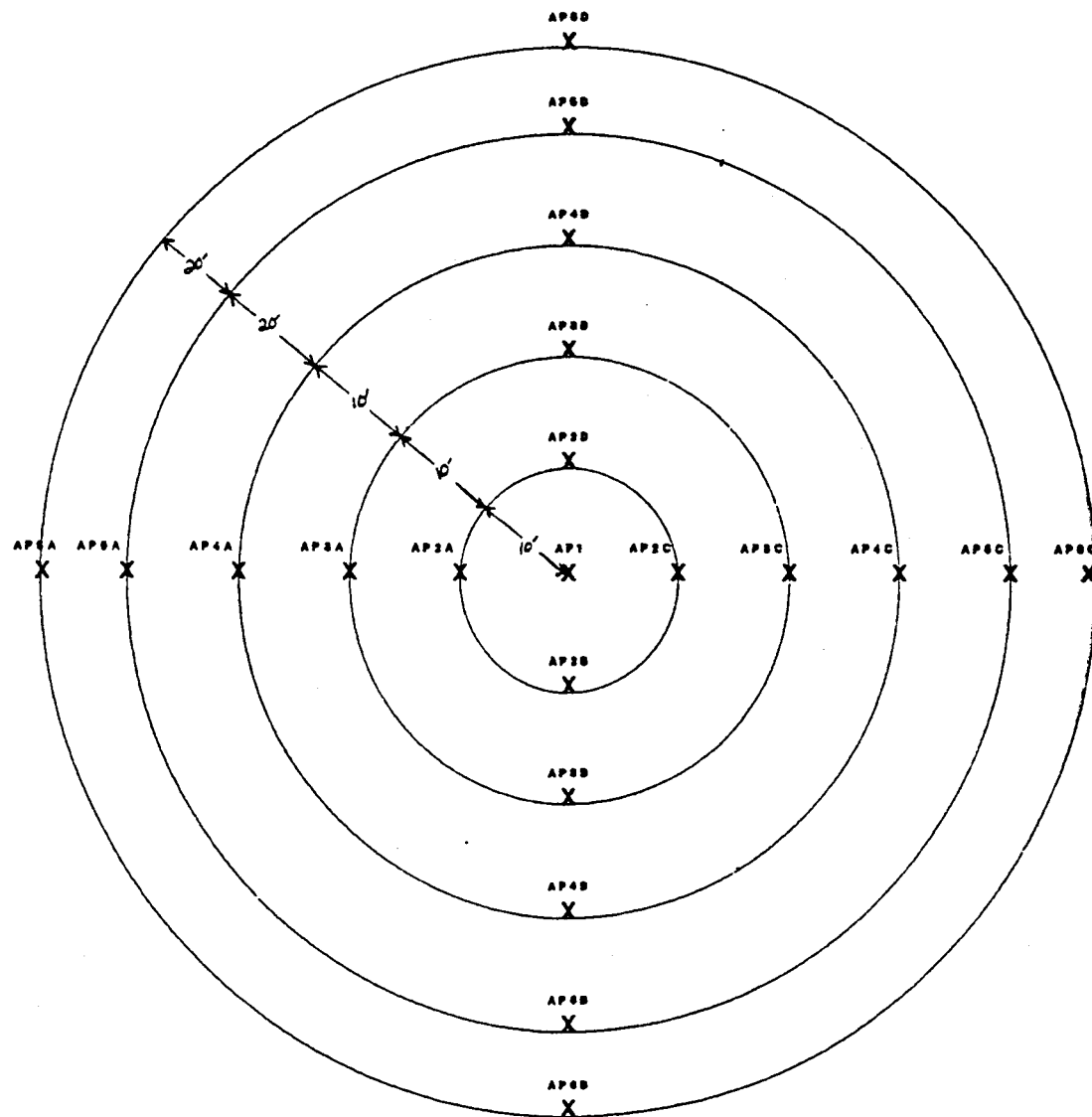
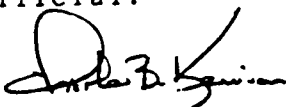


FIGURE 1


Operation Safe Removal  
Soil Sampling Plan for Ft A.P. Hill OD Range

GEORGE E. FRIEL  
BG, USA  
Commander,  
Service Response Force

Official:

  
CHARLES B. Kenison  
COL, MS  
Dir, Special Staff

Approved:

  
Terry A. Stilman  
Federal On Scene Coordinator  
EPA Region III

USA TECHNICAL ESCORT UNIT  
Aberdeen Proving Ground, MD 21010-5423

MEMORANDUM FOR RECORD

27 January 1993

SUBJECT: A.P. Hill Demolition Operations AAR

1. On 27 January, 1993, eight 75mm projectiles were taken to Range 77 and destroyed by detonation.

2. The sequence of events is as follows:

a. The demolition and sampling team arrived at Range 77 at approximately 1310 and downloaded all equipment.

b. I briefed personnel present on the operation and proceeded to direct all unnecessary personnel to the safe area approximately 850 meters upwind of the demolition pit.

c. The EPA personnel began taking additional background soil samples while we prepared the demolition site. CTF personnel were also setting up air monitors approximately 50 meters downwind of the demolition pit.

d. Once all sampling personnel were finished, we began to prepare the projectiles for demolition. Explosives used are as follows:

- 150 ft. - Detonating Cord
- 5 ea - Non-Electric Blasting Caps
- 2 ea - Electric Blasting Caps
- 52 ea - Demolition Blocks M112 (C-4)

e. When the explosives were primed for detonation, the demolition team moved back to the safe area and received clearance from Range Control to detonate the charges. The time of detonation was 1428 hrs.

f. The explosion was characteristic of a normal high explosive detonation. The debris cloud was normal and no unusual smoke or debris was seen.

g. SSG Martin and I proceeded down range to check the shot. We approached from upwind and performed gross level checks utilizing the M18A1 chemical detector kit. Tests 2,4,5, and 7 were done. All results were negative. I certified the site clear and allowed for the sampling personnel to proceed down range to retrieve samples.

h. The results of the air samples taken by CTF personnel were

negative for any agent released in the air after the detonation. Thus, the rounds were assumed to be loaded with high explosives.

i. No scrap or residue was found after detonation.

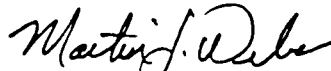
j. Once all sampling was complete, we departed enroute back to Spring Valley.

3. The operation was safe, efficient, and successful.

4. Demolition personnel were as follows:

- OIC - 2LT Weber (USATEU)
- NCOIC - SSG Ouellette (67th EOD)
- Tech - SSG Martin (USATEU)
- Tech - SSG Simmons (67th EOD)
- Tech - SGT J. Johnson (USATEU)
- Tech - SGT Provost (67th EOD)
- Tech - SPC Depold (67th EOD)

5. POC is the undersigned at (202)282-0559 (TOC).

  
Martin J. Weber  
2LT, OD  
TEO



*2*

OPERATION SAFE REMOVAL

27 Jan 93

Subject: Detonation at Ft AP Hill

1. At approx 1550 hrs, Terry Banks, the Environmental Coordinator from Ft. AP Hill called to report on the detonation of 8 rounds that occurred today. She said that everything went great. Everyone who was familiar with EOD operations reported that it looked just like an HE detonation. There was no sign of any unusual residue after the detonation.

2. She had notified the state of the action both 1 hour before and immediately after the action as they had requested. They were satisfied with her report and will await our final report within 48 hours.

*Teresa Mann*

**OPERATION SAFE REMOVAL**

**Subject: Sampling After Detonation of 8 Rounds at Ft AP Hill**

1. 2LT Weber, TEU, performed monitoring using the M18 kit after the detonation. Results were negative. Phil Rice, CBDA, drew air samples using DAAMS tubes. Analyses are being performed on site at Spring Valley and will be available on 28 Jan.
2. Soil samples that were taken by the EPA contractor, Jackie Hom, were sent to ERDEC and AEHA in Edgewood for analysis. We hope results will be available the morning of Friday, 29 Jan.
3. As soon as the soil sampling report is completed and assuming the results show no significant increase in soil contaminants after the detonation, we plan to add a cover letter requesting permission to detonate the remaining solid filled/no-chlorine rounds and fax it concurrently to Steve Frazier and GM Tribble.

*Teresa Mann*

# SPRING VALLEY SOIL SAMPLES

## ANALYSIS RESULTS

FOR

MUSTARD (HD) AND ARSENIC

January 28, 1993

EPA SAMPLE NUMBER	MUSTARD PPM	EXTRACTABLE ARSENIC PPM	TOTAL ARSENIC PPM
AP-1	N.D.	*	*
AP-2	N.D.	*	*
AP-3	N.D.	*	*
AP-4	N.D.	*	*
AP-5	N.D.	0.550 ppm	0.700 ppm
AP-1B	N.D.	0.500 ppm	0.750 ppm
AP-2B	N.D.	0.500 ppm	0.700 ppm
AP-3B	N.D.	0.500 ppm	0.500 ppm
AP-4B	N.D.	0.450 ppm	0.500 ppm
AP-5B	N.D.	0.500 ppm	0.650 ppm

\* Results unavailable until 2:00 PM January 29, 1993  
FAX will be sent 2:00 PM January 29, 1993

January 29, 1993

John E. Ely  
Director  
Office of Compliance and Enforcement  
Virginia Department of Waste Management  
101 North 14th Street  
Richmond, VA 23219

Dear Mr. Ely,

This letter provides information required by the modification dated 27 Jan 93 to the Temporary Emergency Permit to Treat Hazardous Waste issued to Ft. A.P. Hill on 20 Jan 93.

Enclosure 1 includes a Memorandum for Record prepared by the officer in charge of the detonation of eight 75 mm projectiles on 27 Jan 93. It provides the results of monitoring performed immediately after the detonation. Gross level monitoring at the soil surface for cyanogen chloride (test 2), mustard (test 4), hydrogen cyanide (test 5), and phosgene (test 7) using the M18A1 chemical detector kit was performed after the detonation. The results were negative. Low level air monitoring for mustard using Depot Area Agent Monitoring System (DAAMS) tubes was performed during and after the detonation. The results were negative.

Enclosure 2 confirms the absence of risk from mustard, lewisite, and adamsite. Data from the Edgewood Chemical & Biological Defense Agency's laboratory shows no detection of mustard and very low concentrations of arsenic which assures the absence of significant amounts of lewisite and adamsite which are arsenicals.

Enclosure 3 confirms the absence of risk from other chemical warfare agents. Data from the Army Environmental Hygiene Agency's laboratory show no detection of chloroacetophenone or chloropicrin. The laboratory was also unable to detect cyanogen chloride or phosgene.

The original permit application dated 13 Jan 93 explained that excavation of the pit was continuing and additional rounds were expected to be recovered. The excavation was completed and the pit was declared ordnance free the afternoon of 27 Jan 93. Evaluation and classification of the rounds by the process previously explained to you was completed on 28 Jan 93. We determined that there are 90 HE/WP rounds (based on solid fill, no chlorine) currently on site at Spring Valley. A list of the types of rounds is included in enclosure 4.

The on-site monitoring and soil sampling data confirm our determination that the non-chlorine solid filled rounds contain no toxic chemical agents but contain HE or WP.

We respectfully request authorization to treat the remaining HE/WP rounds at Ft. AP Hill under the terms of the emergency permit.

A handwritten signature in black ink, appearing to read "George E. Friel", is written over the typed name.

GEORGE E. FRIEL

BG, USA

Commander,

Service Response Force

*Item # 5*

USA TECHNICAL ESCORT UNIT  
Aberdeen Proving Ground, MD 21010-5423

MEMORANDUM FOR RECORD

27 January 1993

SUBJECT: A.P. Hill Demolition Operations AAR

1. On 27 January, 1993, eight 75mm projectiles were taken to Range 77 and destroyed by detonation.

2. The sequence of events is as follows:

a. The demolition and sampling team arrived at Range 77 at approximately 1310 and downloaded all equipment.

b. I briefed personnel present on the operation and proceeded to direct all unnecessary personnel to the safe area approximately 850 meters upwind of the demolition pit.

c. The EPA personnel began taking additional background soil samples while we prepared the demolition site. CTF personnel were also setting up air monitors approximately 50 meters downwind of the demolition pit.

d. Once all sampling personnel were finished, we began to prepare the projectiles for demolition. Explosives used are as follows:

- 150 ft. - Detonating Cord
- 5 ea - Non-Electric Blasting Caps
- 2 ea - Electric Blasting Caps
- 52 ea - Demolition Blocks M112 (C-4)

e. When the explosives were primed for detonation, the demolition team moved back to the safe area and received clearance from Range Control to detonate the charges. The time of detonation was 1428 hrs.

f. The explosion was characteristic of a normal high explosive detonation. The debris cloud was normal and no unusual smoke or debris was seen.

g. SSG Martin and I proceeded down range to check the shot. We approached from upwind and performed gross level checks utilizing the M18A1 chemical detector kit. Tests 2, 4, 5, and 7 were done. All results were negative. I certified the site clear and allowed for the sampling personnel to proceed down range to retrieve samples.

h. The results of the air samples taken by CTF personnel were

negative for any agent released in the air after the detonation. Thus, the rounds were assumed to be loaded with high explosives.

1. No scrap or residue was found after detonation.

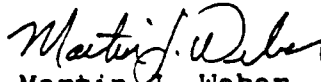
j. Once all sampling was complete, we departed enroute back to Spring Valley.

3. The operation was safe, efficient, and successful.

4. Demolition personnel were as follows:

- OIC - 2LT Weber (USATEU)
- NCOIC - SSG Ouellette (67th EOD)
- Tech - SSG Martin (USATEU)
- Tech - SSG Simmons (67th EOD)
- Tech - SGT J. Johnson (USATEU)
- Tech - SGT Provost (67th EOD)
- Tech - SPC Depold (67th EOD)

5. POC is the undersigned at (202)282-0559 (TOC).

  
Martin J. Weber  
2LT, OD  
TEO

# SPRING VALLEY SOIL SAMPLES

## ANALYSIS RESULTS

FOR

MUSTARD (HD) AND ARSENIC

January 28, 1993

EPA SAMPLE NUMBER	MUSTARD PPM	EXTRACTABLE ARSENIC PPM	TOTAL ARSENIC PPM
AP-1	N.D.	*	*
AP-2	N.D.	*	*
AP-3	N.D.	*	*
AP-4	N.D.	*	*
AP-5	N.D.	0.550 ppm	0.700 ppm
AP-1B	N.D.	0.500 ppm	0.750 ppm
AP-2B	N.D.	0.500 ppm	0.700 ppm
AP-3B	N.D.	0.500 ppm	0.500 ppm
AP-4B	N.D.	0.450 ppm	0.500 ppm
AP-5B	N.D.	0.500 ppm	0.650 ppm

\* Results unavailable until 2:00 PM January 29, 1993  
FAX will be sent 2:00 PM January 29, 1993



United States Army Environmental Hygiene Agency  
Organic Environmental Chemistry Division  
Chromatographic Analysis Branch  
Report of Analysis

Project Number: 37-26-J1FO  
Project Officer: Rebla  
Sampled Installation: American University  
AQAD Numbers: C1879-C1884

Date Received: 27 JAN 93  
Date Extracted: 28 JAN 93  
Date Analyzed: 28 JAN 93  
Quality Control Number: AP 3027  
Procedure: OECD SOP #108.1

AQAD NUMBER	FIELD NUMBER	SAMPLE RESULTS parameter and units <i>ng/g</i>					
		2,6-DNT	2,4-DNT	2,4,6-TNT	RDX	Tetryl	HMX
//////////	//////////	ppm	ppm	ppm	ppm	ppm	ppm
C1879	AP1B	< 1	< 1	< 1	< 1	< 1	< 1
C1880	AP2B	< 1	< 1	< 1	< 1	< 1	2.1
C1881	AP3B	< 1	< 1	< 1	< 1	< 1	< 1
C1882	AP4D	< 1	< 1	< 1	< 1	< 1	< 1
C1883	AP5R	< 1	< 1	< 1	< 1	< 1	< 1
C1884	AP5	< 1	< 1	< 1	< 1	< 1	< 1

COMMENTS

All analyses were performed by gas chromatograph with electron capture detection.

ANALYST(S) | REVIEWED BY:

DATE RESULTS REPORTED:

*DM, JBS* | *CGO*

PRELIMINARY DATA SUMMARY REPORT, OPERATION SAFE REMOVAL, FORT AP WILL OPEN DETONATION, VIRGINIA, 27 JAN 93

SAMPLE NO RADIUS (FT) CHLORACETOPHENE CYANOGEN CHLORIDE CHLOROPICRIN PHOSGENE ARSENIC  
(ALL UNITS MG/KG)\*

PRE-DETONATION SAMPLES

AP1	0	ND	ND	ND	ND	2.4
AP2	10	ND	ND	ND	ND	1.6
AP3	20	ND	ND	ND	ND	1.7
AP4	30	ND	ND	ND	ND	1.6
AP5	50	ND	ND	ND	ND	1.2
MEAN		ND	ND	ND	ND	1.7
VAR		0.000	0.000	0.000	0.000	0.2

POST-DETONATION SAMPLES

AP18	0	ND	ND	ND	ND	2.0
AP28	10	ND	ND	ND	ND	1.6
AP38	20	ND	ND	ND	ND	1.4
AP48	30	ND	ND	ND	ND	1.5
AP58	50	ND	ND	ND	ND	1.9
MEAN		ND	ND	ND	ND	1.7
VAR		0.000	0.000	0.000	0.000	0.0

DETECTION LEVEL

3.83	10.00	3.83	10.00	1.0
------	-------	------	-------	-----

EXCEEDS PRE-DETONATION?

ND	ND	ND	ND	ND
----	----	----	----	----

Enclosure 4 - List of Types or Rounds

<u>Type</u>	<u>Quantity</u>
75 mm	52
3" Stokes	7
WP Igniter	20
Components	3
Livens	4
3" Projectile	3
Smoke Pot	1
	-----
	90



CHEMICAL AND  
BIOLOGICAL DEFENSE  
AGENCY

From the:

OPERATION SAFE REMOVAL  
OPERATIONS CENTER

Fax #: (202)282-0728  
Phone #: (202)282-0634/0642

FROM: COL Kenison Spring Valley, DC		Office Symbol	Office Telephone No. (DSN/Comm.) (202) 282-2445		FAX NO. (DSN/Comm.) (202) 282-0728	
TO: Mr John Elzy Richmond, VA					(804) 225-3753	
Classification Unclassified	Precedence Urgent	No. Pages (incl. Header) 2	Date/Time 29 1801	Month 1	Year 93	Relay Station's Signature Ch. T. Elzy

REMARKS

We will comply with your concerns.  
Attached is the supplemental info you need.  
Regards, COL Chuck Kenison

TRANSMISSION REPORT

THIS DOCUMENT WAS CONFIRMED  
(REDUCED SAMPLE ABOVE - SEE DETAILS BELOW)

\*\* COUNT \*\*

TOTAL PAGES SCANNED : 2  
TOTAL PAGES CONFIRMED : 2

\*\*\* SEND \*\*\*

No.	REMOTE STATION	START TIME	DURATION	#PAGES	MODE	RESULTS
1	1451	1-29-93 5:57PM	1'18"	2/ 2		COMPLETED 9600

TOTAL 0:01'18" 2

NOTE:

No. : OPERATION NUMBER 48 : 4800BPS SELECTED EC : ERROR CORRECT G2 : G2 COMMUNICATION  
PD : POLLED BY REMOTE SF : STORE & FORWARD RI : RELAY INITIATE RS : RELAY STATION  
MB : SEND TO MAILBOX PG : POLLING A REMOTE MP : MULTI-POLLING RM : RECEIVE TO MEMORY

Rounds to be Destroyed  
at  
Ft AP Hill

75 mm. All 52 rounds contain high explosive.

3" Stokes. All 7 rounds contain high explosive.

WP Igniter. All 20 igniters contain white phosphorus.

Components. All 3 are bursters containing high explosive.

Livens. All 4 have been weighed, x-rayed, pin'ed, heated, and carefully examined such that we are sure the only component is high explosive.

3" Projectile. All 3 contain high explosive.

Smoke Pot. The smoke pot contains a burster with high explosive.

USA TECHNICAL ESCORT UNIT  
Aberdeen Proving Ground, MD 21010-5423

MEMORANDUM FOR RECORD

30 January 1993

SUBJECT: A.P. Hill Demolition Operations AAR

1. On 30 January, 1993, ninety munitions were taken to Range 77 and destroyed by detonation.

2. The sequence of events is as follows:

a. Upon arrival at Range 77, all equipment and personnel were downloaded and a briefing of the operation was given to all personnel.

b. While the demolition site was being prepared, the EPA personnel were laying out their sampling plan. Once their work was complete, the unnecessary personnel were directed to the safe area approximately 850 meters upwind of the demolition pits.

c. I set up the air monitoring equipment approximately 25 meters downwind of the demolition pits.

d. Once the site preparations were made, the munitions were prepared for disposal. Explosives used are as follows:

1000 ft. - Detonating Cord  
37 ea - Non-Electric Blasting Caps  
16 ea - Electric Blasting Caps  
571 ea - Demolition Blocks M112 (C-4)

e. When the explosives were ready for priming, we called for clearance from the State of Virginia and Range Control to prime and detonate the charges. Five sequential shots were used utilizing the MK 122 Remote Firing Device. The composition and time of detonation for each shot is as follows:

#1 - 7 ea 3" Stokes	
3 ea 3" Projectile	1335:00 hrs
3 ea HE Components	
#2 - 4 ea Livens Projectile	1336:05 hrs
1 ea Smoke Pot	
#3 - 26 ea 75mm Projectile	1336:55 hrs
#4 - 26 ea 75mm Projectile	1337:40 hrs

SUBJECT: A.P. Hill Demolition Operations AAR

30 January 1993

#5 - 20 ea Igniters

1338:15 hrs

f. Shots #2 and #4 were characteristic of normal high explosive detonations. The debris clouds were normal and no unusual smoke or debris were seen. Shot #1 had a debris cloud that appeared to be either white phosphorous or a smoke compound. It was difficult to distinguish from the firing point. Shot #3 appeared to contain some white phosphorous projectiles based upon the cloud and the lingering phosphorous smell after the shots were cleared. Shot #5 appeared to be white phosphorous residue.

g. SGT J. Johnson and I proceeded down range to check the shots. We approached from upwind and performed gross level checks on each shot hole utilizing the M18A1 chemical detector kit. Tests 2,4,5, and 7 were performed. All results were negative. I certified the site clear and allowed for the sampling personnel to proceed down range to retrieve samples.

h. The results of the air samples taken are not yet complete. They are being submitted to the appropriate personnel for analysis. They will be directed to provide the results to the proper authorities upon completion.

i. No scrap or residue was found after detonation.


j. Once all sampling was complete, we departed enroute back to Spring Valley.

3. The operation was safe, efficient, and successful.

4. Demolition personnel were as follows:

- OIC - 2LT Weber (USATEU)
- NCOIC - SSG Ouellette (67th EOD)
- Tech - SSG Martin (USATEU)
- Tech - SSG Simmons (67th EOD)
- Tech - SGT J. Johnson (USATEU)
- Tech - SGT Provost (67th EOD)
- Tech - SPC Depold (67th EOD)

5. POC is 2LT Weber at DSN 584-2526/2561 (HHD, USATEU).

  
William T. Batt  
LTC, CM  
Commanding

February 1, 1993

John E. Ely  
Director  
Office of Compliance and Enforcement  
Virginia Department of Waste Management  
101 North 14th Street  
Richmond, VA 23219

Dear Mr. Ely,

This letter provides information regarding the detonation of 90 rounds at Ft. AP Hill on 20 Jan 93 in accordance with the Temporary Emergency Permit to Treat Hazardous Waste issued to Ft. A.P. Hill on 20 Jan 93 and amended on 27 Jan 93.

Enclosure 1 includes a Memorandum for Record prepared by the officer in charge of the detonation. As stated the memo, five separate shots were used. Shots 2 and 4 were characteristic of high explosive detonations. Shots 3 and 5 appeared to be white phosphorus. Shot 1 appeared to the EOD personnel to contain white phosphorus or another smoke material. All rounds in this shot passed the screening criteria established for detonation; solid filled with no chlorine signature. Although there may have been a smoke material in this shot, the smoke fills used during the WWI timeframe which could possibly have been in the rounds would not result in any toxic residue when detonated.

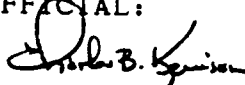
The memo also provides the results of monitoring performed immediately after the detonation. Gross level monitoring at the soil surface for cyanogen chloride (test 2), mustard (test 4), hydrogen cyanide (test 5), and phosgene (test 7) using the M18A1 chemical detector kit was performed after the detonation. The results were negative. Low level air monitoring for mustard using Depot Area Agent Monitoring System (DAAMS) tubes was performed during and after the detonation. The DAAMS tubes were analyzed at the Edgewood RD&E Center and the results were negative.



The emergency phase on the Spring Valley munitions recovery project has ended. You played a key role in allowing proper disposition of the recovered rounds and assuring the safety of the local population. I thank you for your assistance and cooperation.

GEORGE E. FRIEL  
BG, USA  
Commander,  
Service Response Force

OFFICIAL:

  
CHARLES B. KENISON  
COL, MS  
Dir, Special Staff

USA TECHNICAL ESCORT UNIT  
Aberdeen Proving Ground, MD 21010-5423

MEMORANDUM FOR RECORD

30 January 1993

SUBJECT: A.P. Hill Demolition Operations AAR

1. On 30 January, 1993, ninety munitions were taken to Range 77 and destroyed by detonation.

2. The sequence of events is as follows:

a. Upon arrival at Range 77, all equipment and personnel were downloaded and a briefing of the operation was given to all personnel.

b. While the demolition site was being prepared, the EPA personnel were laying out their sampling plan. Once their work was complete, the unnecessary personnel were directed to the safe area approximately 850 meters upwind of the demolition pits.

c. I set up the air monitoring equipment approximately 25 meters downwind of the demolition pits.

d. Once the site preparations were made, the munitions were prepared for disposal. Explosives used are as follows:

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SUBJECT: A.P. Hill Demolition Operations AAR

30 January 1993

#5 - 20 ea Igniters

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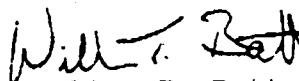
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- Tech - SGT Provost (67th EOD)
- Tech - SPC Depold (67th EOD)

5. POC is 2LT Weber at DSN 584-2526/2561 (HHD, USATEU).

  
William T. Batt  
LTC, CM  
Commanding

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. <i>D.C.P.0.0.0.0.1.6.9.0</i>		Manifest Document No. <i>3.F.0.0.1</i>		2. Page 1 of 1		Information in the shaded areas is not required by Federal law.			
3. Generator's Name and Mailing Address <b>SERVICE RESPONSE FORCE - OPERATION SAFE REMOVAL</b> <b>5015 WARREN ST.</b> <b>WASHINGTON, D.C. 20016</b> 4. Generator's Phone ( <i>800</i> ) <i>331-1238</i> <i>APT., MD 21010-5423</i>						A. State Manifest Document Number					
						B. State Generator's ID					
5. Transporter 1 Company Name <b>67TH EOD</b>						6. US EPA ID Number <b>D.C.8.2.1.0.0.2.1.0.0.4</b>					
7. Transporter 2 Company Name						8. US EPA ID Number					
9. Designated Facility Name and Site Address <b>FORT A.P. HILL</b> <b>ATTN: AFKA-FHE-F</b> <b>BOWLING GREEN, VA 22427</b>						10. US EPA ID Number <b>VA.2.2.1.0.0.2.0.4.1.6</b>					
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number) <b>WASTE PROJECTILE, CLASS 1.1F, UN0167</b>						12. Containers		13. Total Quantity		14. Unit Wt/Vol	
						No.	Type				
J. Additional Descriptions for Materials Listed Above						12. Containers <i>001 CW</i>		13. Total Quantity <i>1.28 P</i>		14. Unit Wt/Vol <i>D001</i> <i>D003</i>	
15. Special Handling Instructions and Additional Information						K. Handling Codes for Wastes Listed Above					
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by <del>air</del> according to applicable international and national governmental regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.											
Printed/Typed Name <b>JAMES L BACON</b>						Signature <i>James L Bacon</i>		Month Day Year <b>10 1 27 93</b>			
17. Transporter 1 Acknowledgement of Receipt of Materials Printed/Typed Name <b>Richard A Simmons</b>						Signature <i>Richard A Simmons</i>		Month Day Year <b>10 1 27 93</b>			
18. Transporter 2 Acknowledgement of Receipt of Materials Printed/Typed Name						Signature		Month Day Year			
19. Discrepancy Indication Space											
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.											
Printed/Typed Name						Signature		Month Day Year			

GENERATOR'S COPY

TRANSPORTER

FACILITY

GENERATOR'S COPY

# LAND DISPOSAL RESTRICTION NOTIFICATION/CERTIFICATION

(A separate form is required for each approved code)

Generator Name: Service Response Force - Oph Safe Removal Approval Code: NONE  
 Generator EPA ID Number: DEP 00000 1690 Manifest Number: SF001

This form is submitted to \_\_\_\_\_ in accordance with the regulations published by EPA in CFR 268, which govern the land disposal of certain untreated hazardous wastes. In accordance with the waste analysis and record keeping requirements specified in 40 CFR 268.1, I have marked the appropriate box below which indicates how my waste must be managed to conform to the land disposal restrictions. The applicable treatment standards for the "F" Solvent and California Listed wastes is listed on the back of this form. Treatment standards for all other waste codes and/or categories can be found in 40 CFR 268 regulations, section 268.41, 268.42, and/or 268.43.

This waste is a Non-Wastewater unless this box is checked ☐ indicating wastewater.

EPA Waste Code	Category/Subcategory and/or Constituent of concern. (Mark N/A if Not Applicable)	Treatment Standard Reference and/or Treatment 5 Letter BOAT Treatment Code	Check only one Box per line Corresponding to the Section Listed Below.							Variance Expiration Date
			A	B	C	D	E	F	G	
D001	ignitable explosive	261.21(a)(2)	<input checked="" type="checkbox"/>							
D003	reactive explosive	261.23(a)(1,7,8)	<input checked="" type="checkbox"/>							

## A. Restricted Waste Requires Treatment

I am the generator of an untreated waste identified above which must be treated to the appropriate treatment standard set forth in 40 CFR 268 Subpart D.

## B. Restricted Waste Treated to Performance Standards

The waste identified above has been treated in compliance with the applicable performance standards specified in 40 CFR 268 Subpart D. The treatment residues were tested and have been found to meet the performance standard specified in 40 CFR Subpart 268.41 or 268.42.

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the process used to support this certification and that, based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the treatment process has been operated and maintained properly so as to comply with the performance levels specified in 40 CFR 268 Subpart D and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA section 3004(d) without dilution of the prohibited waste. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

## C. Restricted Waste Treated by Specified Technology

"I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.42. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

## D. Restricted Waste Meets Treatment Standards Without Prior Treatment

The waste identified above naturally meets the performance standards of 40 CFR 268 Subpart D or 40 CFR 268.32 without any treatment being performed.

"I certify under penalty of law that I personally have examined and am familiar with the waste analysis and testing of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR Part 268 Subpart D. I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment."

## E. Restricted Waste Subject to a Variance

The waste identified is not banned from land disposal in units meeting minimum technology standards since it is subject to a national capacity variance, a treatability variance, or a case-by-case extension which will expire date indicated above.

F. I certify under penalty of law that I personally have examined and am familiar with the waste and that the lab pack contains only the wastes specified in appendix IV to part 268 or solid wastes not subject to regulation under 40 CFR part 261. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine or imprisonment.

G. I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste and that the lab pack contains only organic waste specified in Appendix V to Part 268 or solid waste not subject to regulation under 40 CFR Part 261. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine or imprisonment.

Signature: James Z. Brown Title: Dep On Scene Coordinator Date: 1/27/93

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. D.C.P.O.O.C.O.D. 1.69.0	Manifest Document No. SF.O.O.2	2. Page 1 of 1	Information in the shaded areas is not required by Federal law.			
3. Generator's Name and Mailing Address SERVICE RESPONSE FORCE - OPERATION SAFE REMOVAL 5015 WARREN ST. WASHINGTON, D.C. 20016		ATTN: AMSLB-CG HFG, 11021011-5423		A. State Manifest Document Number				
4. Generator's Phone (202) 282-2445		6. US EPA ID Number DC.821.002.1.0.04		B. State Generator's ID				
5. Transporter 1 Company Name 67TH FOD		7. Transporter 2 Company Name		C. State Transporter's ID				
8. US EPA ID Number		9. Designated Facility Name and Site Address FORT R. PHILL ATTN: AFKA-FHE-F BOWLING GREEN, VA 22427		D. Transporter's Phone				
10. US EPA ID Number		11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)		E. State Transporter's ID				
		12. Containers		F. Transporter's Phone				
		13. Total Quantity		G. State Facility's ID				
		14. Unit Wt/Vol		H. Facility's Phone				
		15. Waste No.						
GENERATOR	a.	WASTE PROJECTILE, UN0167, CLASS 1.1F		017	CW	1.357 P	D001 D003	
	b.	AMMUNITION, SMOKE, WHITE PHOSPHOROUS, 1.2H		002	DM	370 P	D001 D003	
	c.							
	d.							
J. Additional Descriptions for Materials Listed Above				K. Handling Codes for Wastes Listed Above				
15. Special Handling Instructions and Additional Information								
<p>16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by <del>air</del> according to applicable international and national governmental regulations.</p> <p>If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.</p>								
Printed/Typed Name JAMES L. BACON				Signature <i>James L. Bacon</i>		Month Day Year 01/30/93		
TRANSPORTER	17. Transporter 1 Acknowledgement of Receipt of Materials							
	Printed/Typed Name MARVIN J. WILSON, JR. TED				Signature <i>Marvin J. Wilson</i>		Month Day Year 01/30/93	
	18. Transporter 2 Acknowledgement of Receipt of Materials							
Printed/Typed Name				Signature		Month Day Year		
19. Discrepancy Indication Space								
FACILITY	20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.							
	Printed/Typed Name				Signature		Month Day Year	

GENERATOR'S COPY

100

BLS-C5

# LAND DISPOSAL RESTRICTION NOTIFICATION/CERTIFICATION

(A separate form is required for each ☒ code)

Generator Name: SURVILE RESPONSE FORLE - OPERATION SAFE REMOVAL

Approval Code: NONE

Generator EPA ID Number: DCP000001640

Manifest Number: SF002

This form is submitted to \_\_\_\_\_ in accordance with the regulations published by EPA in CFR 268, which govern the land disposal of certain untreated hazardous wastes. In accordance with the waste analysis and record keeping requirements specified in 40 CFR 268.1, I have marked the appropriate box below which indicates how my waste must be managed to conform to the land disposal restrictions. The applicable treatment standards for the "F" Solvent and California Listed wastes is listed on the back of this form. Treatment standards for all other waste codes and/or categories can be found in 40 CFR 268 regulations, section 268.41, 268.42, and/or 268.43.

This waste is a Non-Wastewater unless this box is checked ☐ indicating wastewater.

EPA Waste Code	Category/Subcategory and/or Constituent of concern. (Mark N/A if Not Applicable)	Treatment Standard Reference and/or Treatment & Letter BOAT Treatment Code	Check only one Box per line Corresponding to the Section Listed Below.							Variance Expiration Date
			A	B	C	D	E	F	G	
<u>DD01</u>	<u>IGNITABLE EXPLOSIVE</u>	<u>261.21(a)(2)</u>	<input checked="" type="checkbox"/>							
<u>DD03</u>	<u>REACTIVE EXPLOSIVE</u>	<u>261.23(a)(6)(7)(8)</u>	<input checked="" type="checkbox"/>							

## A. Restricted Waste Requires Treatment

I am the generator of an untreated waste identified above which must be treated to the appropriate treatment standard set forth in 40 CFR 268 Subpart D.

## B. Restricted Waste Treated to Performance Standards

The waste identified above has been treated in compliance with the applicable performance standards specified in 40 CFR 268 Subpart D. The treatment residues were tested and have been found to meet the performance standard specified in 40 CFR Subpart 268.41 or 268.42.

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the process used to support this certification and that, based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the treatment process has been operated and maintained properly so as to comply with the performance levels specified in 40 CFR 268 Subpart D and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA section 3004(d) without violation of the prohibited waste. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

## C. Restricted Waste Treated by Specified Technology

"I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.42. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

## D. Restricted Waste Meets Treatment Standards Without Prior Treatment

The waste identified above naturally meets the performance standards of 40 CFR 268 Subpart D or 40 CFR 268.32 without any treatment being performed.

"I certify under penalty of law that I personally have examined and am familiar with the waste analysis and testing of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR Part 268 Subpart D. I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment."

## E. Restricted Waste Subject to a Variance

The waste identified is not banned from land disposal in units meeting minimum technology standards since it is subject to a national capacity variance, a treatability variance, or a case-by-case extension which will expire date indicated above.

F. I certify under penalty of law that I personally have examined and am familiar with the waste and that the lab pack contains only the wastes specified in Appendix IV to part 268 or solid wastes not subject to regulation under 40 CFR part 261. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine or imprisonment.

G. I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste and that the lab pack contains only organic waste specified in Appendix V to Part 268 or solid waste not subject to regulation under 40 CFR Part 261. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine or imprisonment.

Signature: James Z. Bacon The DEPUTY ON-SCENE CERTIFICATION OFFICER Date: 1/30/93

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**APPENDIX D - SAMPLE ROUNDS TAKEN TO ERDEC  
FOR DRILLING, SAMPLING, AND ANALYSIS**

**OPERATION SAFE REMOVAL**

Subject: Sample Rounds Taken to ERDEC for Drilling, Sampling, and Analysis

1. Situation: The SRF needed to take a representative sample of recovered rounds to ERDEC for drilling, sampling and analysis. The purpose was to gain information on the possible fills for the community and the Phase II commander and for validation of the PINS data.

2. Environmental Regulatory Requirements:

a. On 14 Jan, Maryland Department of the Environment (MDE) officials were requested to allow the shipment of a limited number of rounds representative of the total recovered to ERDEC for drilling, sampling, and analysis. They initially displayed reluctance and requested detailed information about the reason for the request and the specific plans for the rounds. An information paper was prepared and sent on 14 Jan. Friday, 15 Jan was a state holiday and one person was designated to work the issue. Late in the day, approval had still not been granted and the POC was not in his office. The SRF Commander requested intervention by Mr. D. Walker who contacted MDE officials. At approximately 2000 hrs, approval was finally granted to ship three rounds on 16 Jan 93.

b. MDE Officials determined that the action was excluded from hazardous waste regulations under the exemption for samples (COMAR26.13.02.04D). Accordingly, a hazardous waste manifest was not required and other hazardous waste storage and shipment requirements did not apply.

c. The following week, the need to ship additional rounds to ERDEC for sampling became apparent. In order to provide information to the MDE officials to foster their continued support of actions requiring interaction with and/or approval by MDE, a visit to the site was arranged on 25 Jan.

d. Mr. Butch Dye visited the site and gave interim approval to ship 5 additional rounds to ERDEC. The shipment was scheduled for 29 Jan. At the last minute, an additional round was added to the list to go to ERDEC and Mr. Dye granted final approval for shipment of 6 rounds.



CHEMICAL AND  
BIOLOGICAL DEFENSE  
AGENCY

URGENT!!

From the:

OPERATION SAFE REMOVAL

OPERATIONS CENTER

Fax #: (202)282-0728  
Phone #: (202)282-0634/0642

PART 2

		Office Symbol	Office Telephone No. (DSN/Comm.)	FAX NO. (DSN/Comm.)		
FROM:				410-282- 0728		
TO: Butch DYE OR RICK COLLINS		Maryland Department of the Environment		410- 631-3321		
Classification	Precedence	No. Pages (Incl. Header)	Date-Time	Month	Year	Releaser's Signature
U		B7	151735	Jan	93	J. Mulk

REMARKS

MR. Collins - Understood this is not the ordinary way But I'm dealing with some tough issues with DHHS, OSHA + EPA to make. Since we protect our workers + the public at Spring Valley, WASH DC. I need contents of munitions ASAP.

Must fly these munitions Saturday to get my answers. Please help + approve tonight

## OPERATION SAFE REMOVAL

1. The U.S. Army is presently involved in an assessment and removal of buried munitions located in a northwest Washington D.C. development known as "Spring Valley". The location is densely populated and the burial site is located amidst publicly owned housing. Once the imminent hazard is removed, the site will be turned over to the Army Corps of Engineers for further evaluation and possible remediation.

2. The munitions found so far appear to be of two general types: solid-filled and liquid-filled. Historical documentation indicates that of the known fills of these types of munitions, the solid fill was either a high explosive, a lacrimator, or an incendiary. Those containing a liquid, however, are not easily categorized. Suspected fills of these munitions are such that normal non-destructive testing is inconclusive in rendering positive identification.

3. In order to positively identify the contents of the munitions and provide information essential to site remediation, a representative sample of these munitions must be drilled, sampled and analyzed. This information is of great interest to the D.C. government, the local population, and the Corps of Engineers.

4. The Army has carried out drill and assessment operations many times in the past as part of a continuing effort to track the purity of its chemical stockpile. These assessments, however, are no longer performed due to the imminent disposal of the stockpile. As the Army's Center for Chemical Excellence at Edgewood Research Development and Engineering Center (ERDEC) in Edgewood, Maryland performs assessments of all types of chemical samples and material. The unique facilities located at ERDEC also make possible the assessing of chemical filled munitions in a safe manner. These facilities are equipped and prepared to perform the evaluation of the rounds at the present time. No other Army installation could support this action in a timely fashion. Although they could eventually develop the capability, the time delay would be unacceptable.

5. In order to perform the assessment, the following will occur:

1) A representative sample of each caliber of liquid-filled munition will be selected. Selection criteria consists of visual identification and X-ray examination to ascertain explosive content.

2) The selected munitions will then be overpacked in approved, sealed shipping containers and loaded on a UH1H rotary wing aircraft for transport to ERDEC (see attached map).

3) Upon arrival at ERDEC, the munitions will be transported from Weide Army Airfield to an approved surety operating location.

Upon arriving, the munitions will be subjected to a Portable Isotopic Neutron Spectroscopy (PINS), a non-invasive detector. Use of this equipment on these rounds will add to the development of this emerging technology.

4) Once the evaluation by the PINS is completed, the munitions will be placed in a freezer and chilled overnight to approximately 0 degrees F.


5) After a minimum of 10 hours of 0 degrees F, one munition will be moved to the drilling site. The overpack will be removed and the munition will be placed in the drilling apparatus.

6) A sample of the contents will be drawn and sent to an ERDEC lab for analysis. The remaining contents will be transferred into DOT approved bottles.

7) Disposition of the empty munitions will be determined based on the analysis of the contents and will be coordinated with MDE in advance.

8) Disposition of the contents will be determined based on the results of the analysis and will be coordinated with MDE in advance.

It is anticipated that once the rounds are received, they will be refrigerated overnight then they will be evaluated by the PINS, sampled, and analyzed within the next 5 days. Determination of waste disposition will be coordinated soon after results are received.

  
GEORGE E. FRIEL  
BG, USA  
On-Site Coordinator

OPERATION SAFE REMOVAL

Subject: Rounds to be Sent to ERDEC on 29 Jan 93

1. We have tentatively identified 5 rounds to be sent to ERDEC on Friday, 29 Jan 93 for drilling, sampling, and analysis. They are:

<u>Round Number</u>	<u>Type</u>	<u>Fill State</u>
67	75mm	liquid when heated
90	75mm	liquid
87	livers	liquid
113	75mm	liquid when heated
142	75mm	liquid when heated

2. Rounds 87 and 142 have been shown to be free of explosives. Evaluation of the other three rounds is continuing. Only rounds certified by the Cdr, TEU to be free of explosives will be shipped. Any of these rounds which cannot be certified free of explosives will not be sent to ERDEC.

3. The rounds will be transported to APG on an Army helicopter operated by Army pilots. The helicopter is scheduled to depart Spring Valley with the rounds at 1330 hr and to arrive at Weide Airfield in the Edgewood Area of APG at 1430 hrs

4. The drilling operation will be performed in the CTF in the same manner as the previous drilling operation.

*Teresa M Mann*

OPERATION SAFE REMOVAL

Subject: Shipment of Rounds to ERDEC, 29 Jan 93

1. Reference Telephone Conversation with Butch Dye, MDE, 1650 hrs, Thur, 28 Jan 93.
2. Mr. Dye grants final approval for the shipment of up to 5 rounds to ERDEC on 29 Jan 93. He requests a phonecall prior to the shipment to confirm the number of rounds. I will call him.

*Teresa M. Marx*

OPERATION SAFE REMOVAL

Subject: Rounds to be Sent to ERDEC on 29 Jan 93

1. We identified 6 sample rounds which were sent to ERDEC on Friday, 29 Jan 93 for drilling, sampling, and analysis. They are:

<u>Round Number</u>	<u>Type</u>	<u>Fill State</u>
67	75mm	liquid when heated
90	75mm	liquid
87	livens	liquid
113	75mm	liquid when heated
142	75mm	liquid when heated
147	4.7"	small amount of liquid

2. All rounds were certified by the Cdr, TEU to be free of explosives.

3. The rounds were transported to APG on an Army helicopter operated by Army pilots. The helicopter departed Spring Valley with the rounds at 1230 hr and arrived at Weide Airfield in the Edgewood Area of APG at 1325 hrs.

4. The drilling operation will be performed in the CTF in the same manner as the previous drilling operation.

*Teusa M. Man*

OPERATION SAFE REMOVAL  
Subject: Sixth Round to ERDEC

29 Jan 93

1. Reference two telephone conversations with Butch Dye, MDE at 1023 hrs and 1028 hrs on Friday, 29 Jan 92.
2. Mr. Dye approved my request to allow a 6th round, a 4.7" mortar, to be sent to ERDEC today with the shipment of the 5 rounds previously approved for shipment. Mr. Dye requested a memo showing the new list of rounds going to ERDEC.

*Teresa M. Nann*



## APPENDIX E - DISPOSAL OF MISCELLANEOUS WASTE

### OPERATION SAFE REMOVAL PLAN FOR DISPOSAL OF MISCELLANEOUS WASTES

#### 1. Spent Decon Solutions

a. Bleach was used to decon equipment and personnel that were in the recovery site. Potential contaminants of concern which may have been deconned with this solution are lewisite and mustard. This SPENT DECON SOLUTION will be tested for the presence of arsenic and the pH will be measured. It will then be disposed of by a chemical waste contractor, Chemical Waste Management, Inc., under an existing contract with Aberdeen Proving Ground.

b. If the arsenic level is below the RCRA TCLP limit of 5 ppm and the pH is less than 12.5, it will be disposed of as non-hazardous industrial wastewater. If the arsenic level is above the RCRA TCLP limit of 5 ppm or the pH is greater than or equal to 12.5, it will be disposed of by the contractor as hazardous waste with the appropriate hazardous waste codes.

#### 2. Disposable PPE.

a. Disposable personal protective equipment was worn by workers in the recovery site. Potential contaminants of concern are lewisite and mustard. Gaseous materials are not of concern because they are not expected to remain on the PPE even if they come in contact with it. After use, the disposable PPE will be bagged, warmed to 70 degrees, and air space monitored (bubbled) for mustard and lewisite.

b. If the monitoring meets the requirements for 3X, the disposable PPE will be disposed of by a chemical waste contractor, Chemical Waste Management, under an existing contract with Aberdeen Proving Ground. If the monitoring does not meet the requirements for 3X, the disposable PPE will be chemically decontaminated, rinsed, dried, rebagged, warmed, and remonitored. Spent decon solution will be managed as in #1 above. Procedures in #2 will be repeated until the PPE is certified 3X.

#### 3. Reusable PPE.

a. Reusable personal protective equipment was used by workers in the recovery site. Potential contaminants of concern are lewisite and mustard. The reusable PPE will be bagged, warmed to 70 degrees, and air space monitored (bubbled) for mustard and lewisite.

b. If the monitoring meets the requirements for 3X, the reusable PPE will be issued for reuse. If the monitoring does not meet the requirement for 3X, the reusable PPE will be chemically

OPERATION SAFE REMOVAL  
PLAN FOR DISPOSAL OF MISCELLANEOUS WASTES

decontaminated, rinsed, dried, rebagged, warmed, and remonitored. Spent decon solution will be managed as in #1 above. Procedures in #3 will be repeated until the PPE is certified 3X. If deemed necessary, PPE may be disposed of by the chemical waste contractor once it is certified to the 3X level.

4. Large Equipment.

Various pieces of large equipment including a backhoe, vehicles, tents, etc were present beyond the hotline. Of these, only the hackhoe was in the immediate vicinity of the pit and in contact with the dirt in the pit. Air monitoring of the entire area has shown no contamination. Therefore, the vehicles other than the backhoe are known not to be contaminated. Additional investigation will be conducted on the status of the backhoe. Samples of the dirt on the backhoe will be taken and analyzed for lewisite and mustard. Soil samples from the pit are also being analyzed for lewisite and mustard.

If all samples of soil from the pit and the backhoe are within acceptable limits, the backhoe itself was not contaminated and it will be released to the owner.

OPERATION SAFE REMOVAL

1 Feb 93

PLAN FOR DISPOSAL OF MISCELLANEOUS WASTES - Followup

1. Spent Decon Solutions. Bleach was determined to be free of arsenic and was disposed of by a chemical waste contractor, Chemical Waste Management, Inc, under an existing contract with Aberdeen Proving Ground.
2. Disposable PPE. In all cases, the monitoring meet the requirements for 3X and the disposable PPE was disposed of by a chemical waste contractor, Chemical Waste Management, under an existing contract with Aberdeen Proving Ground.
3. Reusable PPE. In all cases, the monitoring meets the requirements for 3X and the reusable PPE will be issued for reuse.
4. Large Equipment. Samples of the dirt on the backhoe and all air monitoring samples were free of lewisite and mustard and all equipment was released for reuse.



# Chemical Waste Management, Inc. BC 8907

## WASTE PROFILE

Profile #

☐ Check here if this is a RecertificationLOCATION OF ORIGINAL ERL / EML

MAD

**GENERAL INFORMATION**

1. GENERATOR NAME OPERATION SAFE REMOVAL / U.S. ARMY Generator USEPA ID. DCP000001690  
CHEMICAL AND BIOLOGICAL DEFENSE AGENCY
2. Generator Address PROVEN PROVING GROUNDS, MD Billing Address: ☐ Same CHEMICAL WASTE MANAGEMENT  
SITE LOCATION: AMERICAN UNIVERSITY TEST SITE P.O. BOX 96  
WASHINGTON, D.C. 20006 SEALSTON, VA 22547
3. Technical Contact/Phone: TERRY MANN (202) 282-0728
4. Alternate Contact/Phone: DAVID MARTIN (703) 775-9000 Billing Contact/Phone: \_\_\_\_\_

**PROPERTIES AND COMPOSITION**

5. Process Generating Waste: DISCHARGING OF ARMY SHELLS DURING WORLD WAR 1 AT TEST SITE
6. Waste Name: EMPTY DISCHARGED BOTTOM HALF OF U.S. ARMY SHELLS, SCRAP METAL, AND DEBRIS
- 7A. Is this a USEPA hazardous waste (40 CFR Part 261)? Yes ☒ No ☐
- B. Identify ALL USEPA listed and characteristic waste code numbers (D.F.K.P.U): D004, D008, D011
- State Waste Codes: \_\_\_\_\_
8. Physical State @ 70°F: A. Solid ☒ Liquid ☐ Both ☐ B. Single Layer ☐ Multilayer ☐ C. Free liquid range 0 to 0 %
- 9A. pH: Range \_\_\_\_\_ to \_\_\_\_\_ or Not applicable ☒ B. Strong Odor ☐ describe NA
10. Liquid Flash Point: < 73°F ☐ 73-99°F ☐ 100-139°F ☐ 140-199°F ☐ ≥ 200°F ☐ N.A. ☒ Closed Cup ☐ Open Cup ☐
11. CHEMICAL COMPOSITION: List ALL constituents (including halogenated organics) present in any concentration and forward available analysis.
- | Constituents                 | Range   | Units | Constituents                                    | Range | Units |
|------------------------------|---------|-------|---|-------|-------|
| DISCHARGED SHELL CASINGS     | 50 - 90 | %     | NOTE: MATERIAL IN SHELL CASING WAS HISTORICALLY |       |       |
| SCRAP METAL                  | 10 - 40 | %     | MANUFACTURED WITH LEAD AND SILVER.              |       |       |
| DEBRIS (SOIL, ROCK, PLASTIC) | 20-50   | %     | ALSO THE AGENT THAT WAS IN THE SHELLS           |       |       |
| WOOD                         | 10 - 30 | %     | CONTAINED A TRACE AMOUNT OF ARSENIC.            |       |       |
|                              |         |       | THEREFORE THE ARMY REQUESTS THE CODES OF        |       |       |
|                              |         |       | D004, D008, D011                                |       |       |
- TOTAL COMPOSITION MUST EQUAL OR EXCEED 100%
12. OTHER: PCBs if yes, concentration \_\_\_\_\_ ppm, PCBs regulated by 40 CFR 761 ☐ Pyrophoric ☐ Explosive ☐ Radioactive ☐  
Benzene if yes, concentration \_\_\_\_\_ ppm. Shock Sensitive ☐ Oxidizer ☐ Carcinogen ☐ Infectious ☐ Other: \_\_\_\_\_
13. If the waste is subject to the land ban and meets the treatment standards, check here: \_\_\_\_\_ and supply analytical results where applicable.

**SHIPPING INFORMATION**

14. PACKAGING: Bulk Solid ☒ Bulk Liquid ☐ Drum ☐ Type/Size: \_\_\_\_\_ Other: ROLL OFFS
15. ANTICIPATED ANNUAL VOLUME: MAXIMUM OF 3 Units: ROLL OFFS Shipping Frequency: ONE TIME ONLY

**SAMPLING INFORMATION**

- 16a. Sample source (drum, lagoon, pond, tank, vat, etc.): NO SAMPLE REQUIRED DUE TO THE MATERIAL BEING DEBRIS
- Date Sampled: \_\_\_\_\_ Sampler's Name/Company: \_\_\_\_\_
- 16b. Generator's Agent Supervising Sampling: \_\_\_\_\_ 17. ☒ No sample required (See Instructions.)

**GENERATOR'S CERTIFICATION**

I hereby certify that all information submitted in this and all attached documents contains true and accurate descriptions of this waste. Any sample submitted is representative as defined in 40 CFR 261 - Appendix I or by using an equivalent method. At relevant information regarding known or suspected hazards in the possession of the generator has been disclosed, I authorize CWM to obtain a sample from any waste shipment for purposes of recertification.

(X) Teresa M Mann Signature TERESA M. MANN Printed (or typed) name and title Environ Consultant 12 Jan 93 Date

CWM Form 8720-1 (Use previous editions) is the property of CWM. CWM 5000, CWM 5000-A-2 and CWM 5000-B



# GENERATOR'S CERTIFICATION

I hereby certify on behalf of OPERATION SAFE REMOVAL, U.S. Army  
(Company Name), (hereinafter for convenience called "Generator"),  
by my signature and as a duly authorized representative of  
Generator, that the attached is an analysis of and information  
regarding waste originating from the Generator's facility located  
at \_\_\_\_\_  
(Location).

I further certify that the attached analysis and information  
is provided in compliance with ADEM Administrative Code Rules 335-  
14-3-.08, and that Chemical Waste Management has been duly  
authorized by the Generator to submit the attached information, and  
this certification where appropriate, in behalf of the Generator  
and in compliance with the aforementioned regulation.

I further certify, under penalty of law, that this document  
and all attachments were prepared under my authorization, direction  
or supervision in accordance with a system designed to assure that  
qualified personnel properly gather and evaluate the information  
submitted. Based on my inquiry of the person or persons who manage  
the system, or those persons directly responsible for gathering the  
information, the information submitted is, the best of my knowledge  
and belief, true, accurate, and complete. I am aware that there  
are significant penalties for submitting false information  
including the possibility of fine and imprisonment for knowing  
violations.

The Generator understands that any approval by the Department  
of Environmental Management for disposal of any waste described by  
the submitted information shall not relieve the Generator from  
liability for compliance with all other applicable statutes and  
regulations regarding the management of hazardous wastes.

Teresa M Mann  
(Signature For Generator)

By: (X) TERESA M. MANN  
(Print or type name)

Its: Environmental Consultant  
(Title of individual whose signature appears above)

Date: 12 Jan 93  
(Date on which this document is executed)



STATE OF NEW YORK  
DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
DIVISION OF HAZARDOUS SUBSTANCES REGULATION  
**HAZARDOUS WASTE MANIFEST**

P.O. Box 12820, Albany, New York 12212

Form Approved OMB No. 2050-0239 Expires 6-30-94

Please print or type. Do not staple.

<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA No. <b>DC P 00 0 00 1 69 6 50 7 99</b>		Manifest Summary		2. Page 1 of 1		Information in the shaded areas is not required by Federal Law.			
3. Generator's Name and Mailing Address <b>Service Response Force-Operation Safe Removal 5015 Warren St. Washington, DC 20016</b>						A. State Manifest Document No. <b>NY B 449844 3</b>					
4. Generator's Phone ( ) <b>(202) 541-1335</b>						B. Generator's ID <b>SAME</b>					
5. Transporter 1 (Company Name) <b>Chemical Waste Management Inc.</b>						C. State Transporter's ID <b>50120917</b>					
6. US EPA ID Number <b>110109191-001-1581</b>						D. Transporter's Phone ( ) <b>(703) 778-2207</b>					
7. Transporter 2 (Company Name)						E. State Transporter's ID					
8. US EPA ID Number						F. Transporter's Phone ( )					
9. Designated Facility Name and Site Address <b>CWN Chemical Services, Inc. 1350 Balmer Rd Rock 1 City, NY 14107</b>						G. State Facility's ID <b>SAME</b>					
10. US EPA ID Number <b>NY1004918361679</b>						H. Facility's Phone <b>(716) 754 2231</b>					
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)						12. Containers		13. Total Quantity		14. Unit	
						No. Type		Wt/Vol		I. Waste No.	
a. <b>20 HAZARDOUS WASTE SOLID, N.O.S. CWM-E NA9189 (Acetic w/Lead, Acetic, S.L.C.)</b>						<b>XXI (1) XXXXXS Y</b>				<b>EPA 8004 DOE, 2001 STATE</b>	
b.										EPA STATE	
c.										EPA STATE	
d.										EPA STATE	
J. Additional Descriptions for Materials listed Above						K. Handling Codes for Wastes Listed Above					
a. <b>20 HAZARDOUS WASTE SOLID, N.O.S. CWM-E NA9189 (Acetic w/Lead, Acetic, S.L.C.)</b>						a. <b>L</b> c. <input type="checkbox"/>					
b.						b. <input type="checkbox"/> d. <input type="checkbox"/>					
15. Special Handling Instructions and Additional Information <b>DO NOT MIX WITH OTHER WASTES EMERGENCY RESPONSE GUIDE #31 24 HR EMERGENCY RESPONSE: 1-800-424-9300</b>						<b>20.0. Reported</b>					
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations. If I am a large quantity generator, I certify that I have program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR if I am a small generator, I have made a good faith effort to minimize my waste and select the best waste management method that is available to me and that I can afford.											
Printed/Typed Name <b>James L. Sullivan</b>						Signature <b>James L. Sullivan</b>					
17. Transporter 1 (Acknowledgement or Receipt of Materials)						Signature <b>David L. Hanning</b>					
Printed/Typed Name <b>David L. Hanning</b>						Signature <b>David L. Hanning</b>					
18. Transporter 2 (Acknowledgement or Receipt of Materials)						Signature					
Printed/Typed Name						Signature					
19. Discrepancy Indication Space											
20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in item 19											
Printed/Typed Name						Signature					
						Mo. Day Year					

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the N.Y. Dept. of Environmental Conservation (518) 457-7362.

Generator Name: Service Response Force Operations Safe Removal

Manifest Doc. No.: 30161

CWM Profile Number: B C 8 9 1 0 7

State Manifest No.: NYB4498443

1. Is this waste a non-wastewater or a wastewater? (See 40 CFR 268.2) Check ONE: ☒ Non-Wastewater ☐ Wastewater
2. If this waste is subject to any California List restrictions enter the letter from below (either A, B1, or B2) next to each restriction that is applicable:  
 \_\_\_\_\_ HOCs, \_\_\_\_\_ PCBs, \_\_\_\_\_ Acid, \_\_\_\_\_ Metals, \_\_\_\_\_ Cyanides.
3. Identify ALL USEPA hazardous waste codes that apply to this waste shipment, as defined by 40 CFR 261. For each waste code, identify the corresponding subdivision, or check NONE if the waste code has no subdivision. Also check which treatment standards apply. Spent solvent and California List treatment standards are listed on the back of this form. If F039, multi-source leachate applies, those standards must be attached by the generator.

REF	4. US EPA HAZARDOUS WASTE CODE(S)	5. SUBDIVISION		6. APPLICABLE TREATMENT STANDARDS			7. HOW MUST THE WASTE BE MANAGED? ENTER THE LETTER FROM BELOW
		ENTER THE SUBDIVISION DESCRIPTION IF NOT APPLICABLE SIMPLY CHECK NONE		6.a - PERFORMANCE-BASED: CHECK AS APPLICABLE		6.b - SPECIFIED TECHNOLOGY: IF APPLICABLE ENTER THE 40 CFR 268.42-TABLE 1 TREATMENT CODE(S)	
		DESCRIPTION	NONE	268.41(a)	268.43(a)	268.42(a)	
1	D004		X				C 05/08/93
2	D008		X				C 05/08/93
3	D011		X				C 05/08/93
4							
5							
6							
7							
8							
9							
10							

To list additional USEPA waste code(s) and subcategory(s), use the supplemental sheet provided (CWM-2001-B) and check here: ☐

HOW MUST THE WASTE BE MANAGED? In column 7 above, enter the letter (A, B1, B2, B3, C, or D) below that describes how the waste must be managed to comply with the land disposal regulations (40 CFR 268.7). Please understand that if you enter the letter B1, B2, B3, or D, you are making the appropriate certification as provided below.

**A. RESTRICTED WASTE REQUIRES TREATMENT**

This waste must be treated to the applicable treatment standards set forth in 40 CFR Part 268 Subpart D, 268.32, or RCRA Section 3004(d).

**B.1 RESTRICTED WASTE TREATED TO PERFORMANCE STANDARDS**

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and that, based upon my inquiry of those individuals immediately responsible for obtaining this information, I believe that the treatment process has been operated and maintained properly so as to comply with the performance levels specified in 40 CFR part 268 Subpart D and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA Section 3004(d) without impermissible dilution of the prohibited waste. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment."

**B.2 RESTRICTED WASTES FOR WHICH THE TREATMENT STANDARD IS EXPRESSED AS A SPECIFIED TECHNOLOGY (AND THE WASTE HAS BEEN TREATED BY THAT TECHNOLOGY)**

"I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.42. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

**B.3 GOOD FAITH ANALYTICAL CERTIFICATION - FOR INCINERATED ORGANICS**

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and that, based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the nonwastewater organic constituents have been treated by incineration in units operated in accordance with 40 CFR Part 264 Subpart O or Part 265 Subpart O, or by combustion in fuel substitution units operating in accordance with applicable technical requirements, and I have been unable to detect the nonwastewater organic constituents despite having used best good faith efforts to analyze for such constituents. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

**C. RESTRICTED WASTE SUBJECT TO A VARIANCE**

This waste is subject to a national capacity variance, a treatability variance, or a case-by-case extension. Enter the effective date of prohibition in column 7 above.

**D. RESTRICTED WASTE CAN BE LAND DISPOSED WITHOUT FURTHER TREATMENT**

"I have determined that this waste meets all applicable treatment standards set forth in 40 CFR Part 268 Subpart D, and all applicable prohibition levels set forth in Section 268.32 or RCRA Section 3004(d), and therefore, can be land disposed without further treatment. A copy of all applicable treatment standards and specified treatment methods is maintained at the treatment, storage and disposal facility named above. "I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR Part 268 Subpart D and all applicable prohibitions set forth on 40 CFR 268.32 or RCRA section 3004(d). I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting false certification, including the possibility of a fine and imprisonment."

**E. WASTE IS NOT CURRENTLY SUBJECT TO PART 268 RESTRICTIONS**

This waste is a newly identified waste that is not currently subject to any 40 CFR Part 268 restrictions

I hereby certify that all information submitted in this and all associated documents is complete and accurate to the best of my knowledge and information.

Signature: James L. Bacon

Title: Dep. Dir. San. Coordinator Date: \_\_\_\_\_



STATE OF NEW YORK  
DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
DIVISION OF HAZARDOUS SUBSTANCES REGULATION

## HAZARDOUS WASTE MANIFEST

P.O. Box 12820, Albany, New York 12212

Form Approved OMB No. 2050-0039 Expires 9-30-94

Please print or type. Do not Staple.

<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA No. D.C.P. 000001690130322		Manifest Document No. 1		2. Page 1 of 1		Information in the shaded areas is not required by Federal Law.	
3. Generator's Name and Mailing Address SERVICE RESPONSE FORCE-OPERATION SAFE REMOVAL 5015 WARREN ST. Washington DC 20016 40 C.D.R. CBOA ATTN: AMSCB-CG 4. Generator's Phone (800) 331-4235 ARG, MD 20610-5423				A. State Manifest Document No. NY B 449845 2					
5. Transporter 1 (Company Name) CHEMICAL WASTE MANAGEMENT, INC. IL 1019492026811				6. US EPA ID Number		B. Generator's ID SAME			
7. Transporter 2 (Company Name)				8. US EPA ID Number		C. State Transporter's ID 78-99957			
9. Designated Facility Name and Site Address CWM CHEMICAL SERVICES, INC. 1550 BALMER RD Model City NY 14107 NY D0498316679				10. US EPA ID Number		D. Transporter's Phone (703) 775-2207			
						E. State Transporter's ID			
						F. Transporter's Phone ( )			
						G. State Facility's ID SAME			
						H. Facility's Phone (716) 754-8231			
11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)				12. Containers		13. Total Quantity		14. Unit Wt/Vol	
a. RR HAZARDOUS waste Solid, N.O.S. ORM-E NA 9189 (Debris w/Lead, Arsenic, Silver)				No. Type				I. Waste No. EPA 0004 DOCS, 2011 STATE	
b.								EPA STATE	
c.								EPA STATE	
d.								EPA STATE	
J. Additional Descriptions for Materials listed Above Debris w/ Lead, a. Arsenic, Silver 210 c				K. Handling Codes for Wastes Listed Above a <input checked="" type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/>					
b				b <input type="checkbox"/> c <input type="checkbox"/>					
15. Special Handling Instructions and Additional Information D.O.#32 PROJECT # 67222 Bill Princeton: ATTN: MIKE CLARK EMERGENCY RESPONSE WORK #31 24 HR. EMERGENCY RESPONSE: CWM AT (202) 632-9731 W/O-218612				16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations. If I am a large quantity generator, I certify that I have program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR if I am a small generator, I have made a good faith effort to minimize my waste and select the best waste management method that is available to me and that I can afford.					
Printed/Typed Name Earl Roy				Signature Earl Roy				Mo. Day Year 10/20/93	
17. Transporter 1 (Acknowledgement of Receipt of Materials)				18. Transporter 2 (Acknowledgement of Receipt of Materials)					
Printed/Typed Name EARL ROY				Signature Earl Roy				Mo. Day Year 10/20/93	
Printed/Typed Name				Signature				Mo. Day Year	
19. Discrepancy Indication Space ITEM C: ADD (IL) ACTUAL QUAN REC'D: 4540 P.				20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.					
Printed/Typed Name T. F. BRADY SR				Signature T. F. Brady Sr.				Mo. Day Year 020293	

In case of emergency or spill immediately call the National Response Center (800) 424-8802 and the N.Y. Dept. of Environmental Conservation (516) 457-7362.



Generator Name: Service Response Force Operations Safe RemovalManifest Doc. No.: 30322CWM Profile Number: BC8907State Manifest No.: 0484498452

1. Is this waste a non-wastewater or a wastewater? (See 40 CFR 268.2) Check ONE: ☒ Non-Wastewater ☐ Wastewater
2. If this waste is subject to any California List restrictions enter the letter from below (either A, B1, or B2) next to each restriction that is applicable: \_\_\_\_\_ HOCs, \_\_\_\_\_ PCBs, \_\_\_\_\_ Acid, \_\_\_\_\_ Metals, \_\_\_\_\_ Cyanides.
3. Identify ALL USEPA hazardous waste codes that apply to this waste shipment, as defined by 40 CFR 261. For each waste code, identify the corresponding subdivision, or check NONE if the waste code has no subdivision. Also check which treatment standards apply. Spent solvent and California List treatment standards are listed on the back of this form. If F039, multi-source leachate applies, those standards must be attached by the generator.

REF #	4. US EPA HAZARDOUS WASTE CODE(S)	5. SUBDIVISION		6. APPLICABLE TREATMENT STANDARDS			7. HOW MUST THE WASTE BE MANAGED? ENTER THE LETTER FROM BELOW
		ENTER THE SUBDIVISION DESCRIPTION IF NOT APPLICABLE SIMPLY CHECK NONE		6.a - PERFORMANCE-BASED: CHECK AS APPLICABLE		6.b - SPECIFIED TECHNOLOGY: IF APPLICABLE ENTER THE 40 CFR 268.42-TABLE 1 TREATMENT CODE(S)	
		DESCRIPTION	NONE	268.41(a)	268.43(a)	268.42(a)	
1	D004		X				C 5/08/93
2	D003		X				C 5/08/93
3	D011		X				C 5/08/93
4							
5							
6							
7							
8							
9							
10							

To list additional USEPA waste code(s) and subcategory(s), use the supplemental sheet provided (CWM-2001-B) and check here: ☐

HOW MUST THE WASTE BE MANAGED? In column 7 above, enter the letter (A, B1, B2, B3, C, or D) below that describes how the waste must be managed to comply with the land disposal regulations (40 CFR 268.7). Please understand that if you enter the letter B1, B2, B3, or D, you are making the appropriate certification as provided below.

**A. RESTRICTED WASTE REQUIRES TREATMENT**

This waste must be treated to the applicable treatment standards set forth in 40 CFR Part 268 Subpart D, 268.32, or RCRA Section 3004(d).

**B.1 RESTRICTED WASTE TREATED TO PERFORMANCE STANDARDS**

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and that, based upon my inquiry of those individuals immediately responsible for obtaining this information, I believe that the treatment process has been operated and maintained properly so as to comply with the performance levels specified in 40 CFR part 268 Subpart D and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA Section 3004(d) without impermissible dilution of the prohibited waste. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment."

**B.2 RESTRICTED WASTES FOR WHICH THE TREATMENT STANDARD IS EXPRESSED AS A SPECIFIED TECHNOLOGY (AND THE WASTE HAS BEEN TREATED BY THAT TECHNOLOGY)**

"I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.42. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

**B.3 GOOD FAITH ANALYTICAL CERTIFICATION - FOR INCINERATED ORGANICS**

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and that, based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the nonwastewater organic constituents have been treated by incineration in units operated in accordance with 40 CFR Part 264 Subpart O or Part 265 Subpart O, or by combustion in fuel substitution units operating in accordance with applicable technical requirements, and I have been unable to detect the nonwastewater organic constituents despite having used best good faith efforts to analyze for such constituents. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

**C. RESTRICTED WASTE SUBJECT TO A VARIANCE**

This waste is subject to a national capacity variance, a treatability variance, or a case-by-case extension. Enter the effective date of prohibition in column 7 above.

**D. RESTRICTED WASTE CAN BE LAND DISPOSED WITHOUT FURTHER TREATMENT**

"I have determined that this waste meets all applicable treatment standards set forth in 40 CFR Part 268 Subpart D, and all applicable prohibition levels set forth in Section 268.32 or RCRA Section 3004(d), and therefore, can be land disposed without further treatment. A copy of all applicable treatment standards and specified treatment methods is maintained at the treatment, storage and disposal facility named above. "I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR Part 268 Subpart D and all applicable prohibitions set forth on 40 CFR 268.32 or RCRA section 3004(d). I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting false certification, including the possibility of a fine and imprisonment."

**E. WASTE IS NOT CURRENTLY SUBJECT TO PART 268 RESTRICTIONS**

This waste is a newly identified waste that is not currently subject to any 40 CFR Part 268 restrictions.

I hereby certify that all information submitted in this and all associated documents is complete and accurate, to the best of my knowledge and information.

Signature: James Zbaw Title: Dep OSC Spring Valley Date: 02/01/93

TSDF Operating Record Copy—Must Accompany Shipment



P.O. BOX 19276

SPRINGFIELD, ILLINOIS 62794-9276 (217) 782-6761

State Form LPC 62 8/81

IL532-0610

PLEASE TYPE

(Form designed for use on elite (12-pitch) typewriter.)

EPA Form 8700-22 (Rev. 9-88)

Form Approved OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of 1	Information in the shaded areas is not required by Federal law, but is required by Illinois law
3. Generator's Name and Mailing Address Service Response Force - Operation Safe Removal 5015 WARREN ST. Washington, DC 20016		Location If Different c/o CDR. CBDA ATTN: AMXB-CQ AP6.mda1010-54310	4. Generator's Phone (800) 1331-1238	5. Transporter 1 Company Name Chemical Waste Management, Inc.	6. US EPA ID Number ILD099202681
7. Transporter 2 Company Name		8. US EPA ID Number	A. Illinois Manifest Document Number IL 4619726		
9. Designated Facility Name and Site Address TRADE WASTE INCINERATION 7 Mobik Ave SAUGET, IL 62201		10. US EPA ID Number ILD098642424	B. Illinois Generator's ID Number A1111001150316		
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)		12. Containers No.	13. Total Quantity	14. Unit w/vol	15. Fee Paid, If Applicable
a. NON-REGULATED MATERIAL NON-REGULATED NONE (PPE & DEBRIS)		X 116 WX XX 22	2		
b. NON-REGULATED MATERIAL NON-REGULATED NONE (Decontaminating Solution: Bleach)		XX 2 TP XX XX 22	2		
c.					
d.					
J. Additional Descriptions for Materials Listed Above 11. A. Profile # B68707 11. B. Profile # B68706		K. Handling Codes for Wastes Listed Above In Item # 74 1 = Gallons 2 = Cubic Yards			
15. Special Handling Instructions and Additional Information D.O.# 32 C.O.D. Registered		Bill Princeton Project # 6A222 ATTN: M. CLARK			
24 HR. EMERGENCY RESPONSE: CWM AT (205) 652-9721					
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment. OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.					
Printed/Typed Name JAMES L BACON		Signature James L Bacon		Date 02.01.99	
17. Transporter 1 Acknowledgement of Receipt of Materials		Signature David L Hemmings		Date 02.01.99	
18. Transporter 2 Acknowledgement of Receipt of Materials		Signature		Date	
19. Discrepancy Indication Space					
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.					
Printed/Typed Name		Signature		Date	

This Agency is authorized to require, pursuant to Illinois Revised Statutes, Chapter 111, Section 21, that this information be submitted to the Agency. Failure to provide the information may result in a civil penalty against the owner or operator of not to exceed \$23,000 per day of violation. Failure to provide this information may result in a fine up to \$50,000 per day of violation and imprisonment up to 3 years. This form has been approved by the Forms Management Center.

COPY 1. TSD MAIL TO GENERATOR COPY

OPERATION SAGE REMOVAL  
Subject: Drum of Contaminated Soil

1 Feb 93

1. Situation. Earlier today it was thought that a drum of heavy metal contaminated soil was inadvertently shipped back to Edgewood Area, APG during demobilization at Spring Valley. After investigating the situation, we determined that there was no drum of contaminated soil. A very small amount of contaminated soil was recovered from the pit and sent to the lab as a sample for analysis. The surrounding soil was free of contamination.

2. Discussion.

a. During excavation in the munitions pit, TEU personnel discovered an area of bright orange soil which they initially thought was TNT contamination. They removed the discolored soil, placed it in a jar, and performed preliminary analysis on sample using the Viking. Results indicated the contamination was not agent but could be TNT. The sample was then sent to the ERDEC lab for further analysis.

b. At the ERDEC lab, the sample was analyzed and found to contain no TNT. It did, however, contain relatively high levels of total extractable metals.

c. There was a 55 gallon drum near the excavation pit which held a bag of soil later determined to be completely free of contamination. This drum was incorrectly identified to the Special Staff as a drum of possible TNT contaminated soil. We pursued plans for disposal of the "drum of contaminated soil" unaware of the fact that such a drum did not exist. The only such soil was the sample that had been sent for analysis.

d. Chem Waste Mgmt and the APG COR arrived on 1 Feb 93 to remove chemical waste including the fictitious drum of contaminated soil. At approx 1050 hrs, the APG COR and the on-site environmental consultant visited the site to view the waste and were unable to locate the drum of contaminated soil. Concerned that waste may have been inadvertently transported back to Edgewood, they immediately contacted APGSA. The actual events which lead to this misunderstanding were uncovered upon talking to personnel at the analytical lab and personnel at TEU who actually removed the single jar full of contaminated soil.

3. Conclusion.

- a. There was a drum (empty)
- b. There was contaminated soil (in a jar)
- c. There was NOT a drum of contaminated soil.

*James M. Man*

FAX  
671-4608

<- type 146  
(Message # 146: 1588 bytes)  
Date: Thu, 28 Jan 93 6:26:04 EST  
From: Marguerite E. Brooks <mebrooks@cbda6.apgea.army.mil>  
To: gomason@cbda6.apgea.army.mil  
cc: mebrooks@cbda6.apgea.army.mil  
Subject: Analysis of DC Sample

Pig # 10 was delivered by TEU to E3300 at 1530 hours, 22 January 1993. Sample #1 was a "bright orange dirt from around a 75mm at NE corner of pit 50" deep. Analysis of solvent extracts of the soil by nuclear magnetic resonance (NMR), direct inlet/mass spectrometry, gas chromatography/mass spectrometry (GC/MS) and liquid chromatography (LC) identified only hydrocarbons typical of soil background. Elemental analysis showed unusually high levels of several metals. Arsenic analysis has not yet been performed. The elemental data available is:

Element	ppm
Aluminum	20,500
Barium	180
Cadmium	19
Calcium	90
Copper	114
Iron	96,200
Lead	3,520
Magnesium	92
Manganese	137
Potassium	11,200
Sodium	3,540
Sulfur	6,360
Vanadium	32
Zinc	32

<-

APPENDIX F - SOIL SAMPLING PLAN TO VERIFY TERMINATION  
OF THE EMERGENCY RESPONSE PHASE  
Operation Safe Removal

1. SITUATION. Immediately after approval of the verification plan, action began on the sampling plan which was necessary to support

2. DISCUSSION.

a. Action Officer. Although this action would normally be handled by the environmental consultant, that person was busily involved in coordinating the permits and transportation plans associated with disposal of liquid-filled/solid-filled munitions. Therefore, this soil sampling plan was actually prepared by the director of the special staff.

b. Approval: The plan was coordinated with the Emergency Response Team of EPA's Region III. After receiving EPA approval, the Verification Plan and the Sampling Plan were sent to the Department of Health and Human Services and the Army Operations Center for their use, as appropriate.

c. Implementation: Sample collection began immediately after arrival onsite. Because of analytical sophistication, laboratory turn-around times exceeded 48 hours.

(1) Daily Feedback: After a brief delay, results were received daily from both ERDEC and AEHA. Results were very low or not detectable which instilled confidence in the people who were working in the pit.

(2) Emergency Phase Termination: Even though all the soil data was not yet available at termination of the emergency phase, it was possible to show that analytical results over the duration of the excavation were consistently low (or none) which served as the basis for verifying the safety of the pit and pile.

(3) Remediation Phase Data: When analytical work on the soil samples is done, copies of the final report will be provided to the Baltimore District of the Corps of Engineers for their use in making decisions concerning remediation removals.

COL Charles B. Kenison  
OPERATION SAFE REMOVAL  
Special Staff  
27 Jan 93

25 Jan 1993

OPERATION "SAFE REMOVAL"  
Soil Sampling Plan

1. SITUATION.

a. On 5 January 1993, while digging the trench to make the sewerage connection to a home under construction, a commercial real estate developer discovered a cache of potentially hazardous explosive and chemical munitions at a formerly used defense site located in the Spring Valley subdivision of Washington, DC.

b. Before the termination of the Emergency Response Phase, it is important to assure that the soil excavated from the pit during recovery operations does not pose an imminent threat to the residents of Spring Valley.

2. PURPOSE.

a. The primary purpose of this sampling plan is to develop sufficient analytical data to:

(1) Assure the safety of soil removed from the pit

(2) Assure that potential contamination has not been spread beyond the pit and the pile inadvertently during the recovery operation.

(3) Determine the naturally occurring background levels of metals in the soil to assure perspective during subsequent interpretation of data.

b. Another important purpose of this sampling plan is to develop trust and confidence in the data by:

(1) Having EPA oversee sample collection to assure the absence of bias.

(2) Having EPA analyze split samples for total metals and BNA (semivolatiles) and other site-related contaminants, at their discretion, to assure analytical accuracy.

3. SAMPLE MANAGEMENT.

a. Sampling Pattern.

(1) Locations.

(a) Primary Locations. In order to assure the safety of soil removed from the pit, samples shall be collected from the following:

1. Munitions pit (walls and floor)
2. Soil pile (sides and top)

(b) Lateral Locations. In order to assure that potential contamination has not been spread beyond the pit and pile, samples shall be collected from two heavily used locations and from several nearby water sources:

1. X-Ray tent
2. Decon tent
3. Surface streams
4. Dalecarlia reservoir
5. Nearby monitoring well

(c) Background Locations. In order to determine the background levels of naturally occurring metals in the soil, samples, from both surface and depth, shall be collected from the following locations:

1. Open areas astride 52d Place
2. Open areas near the reservoir

(2) Frequencies. Some samples shall be collected daily; others shall be collected weekly; still others shall be collected once. Specific frequencies are as follows:

(a) Munitions Pit. Samples shall be collected once per day immediately after first entry monitoring has verified the safety of the site each morning.

(b) Soil Pile. Samples shall be collected once per day immediately after first entry monitoring has verified the safety of the site each morning.

(c) X-Ray Tent. Samples shall be collected once per week at the discretion of EPA representatives.

(d) Decon Tent. Samples shall be collected once per week at the discretion of EPA representatives.

(e) Surface Streams. Samples shall be collected once from each of the nearby streams at the discretion of EPA representatives.

(f) Surface Reservoir. Samples shall be collected once from the nearby surface reservoir at the discretion of EPA representative.

(g) Monitoring Well. Samples shall be collected once from a nearby monitoring well at the discretion of EPA representatives.

(h) Open Areas near 52d Place. Samples shall be collected as directed by the EPA representatives.

(i) Open area near the reservoir. Samples shall be collected as directed by the EPA representatives.

(3) Number. Recognizing that the primary purpose of sampling is to assure the safety of the soil removed from the pit, a total of at least 14 samples shall be collected from the pit and pile. To assure the absence of spread, at least 5 samples shall be collected from the vicinities of the X-Ray and Decon Tents. In addition, at least 5 samples shall be taken from the various water sources in the immediate area. To assure adequate background data, at least 12 samples shall be collected from the various background sampling locations. The totals are as follows:

(a) <u>Munitions Pit</u> .	2/day X 10 days.....	20
(b) <u>Soil Pit</u> .	2/day X 10 days.....	20
(c) <u>X-Ray Tent</u> .	1/week X 3 weeks.....	3
(d) <u>Decon Tent</u> .	1/week X 3 weeks.....	3
(e) <u>Surface Streams</u> .	2 samples.....	2
(f) <u>Reservoir</u> .	1 sample.....	1
(g) <u>Monitoring Well</u> .	1 sample.....	1
(h) <u>Near 52d Place</u> .	9 samples.....	9
(g) <u>Near Reservoir</u> .	1 sample.....	1
	At least.....	60



(4) Type. The specific type of sample varies with the media to be sampled as follows:

(a) Soil Samples. All shall be composite samples.

(b) Water Samples. All shall be grab samples..

b. Sample Collection.

(1) Volume/Containerization.

(a) Soil samples. Soil samples shall be collected initially in 32 ounce glass jars, from which they shall be then transferred to a plastic bag for mixing to assure homogeneity, from which they shall be then transferred to two 8 ounce glass jars (which are teflon sealed) and two 40ml VOA vials (which are teflon sealed) for transport to laboratories.

(b) Water samples. Each water sample shall be collected in two 1 liter plastic bottles plus two 80 ounce amber glass bottles.

(2) Preservatives.

(a) Soil samples. Samples require no special preservatives, but shall be iced until shipped.

(b) Water samples. Water samples in the 1 liter bottles shall be preserved with Nitric acid. Preservatives are not required in the amber jars. However, they shall be iced until shipped.

(3) Identification.

(a) Soil samples. A unique identification number shall be assigned to each sample by the EPA representatives.

(b) Water samples. A unique identification number shall be assigned to each sample by the EPA representatives.

c. Sample Shipment

(1) Safety.

(a) Army Samples. Soil samples shall first be sent to Edgewood Research, Development, and Engineering Center (ERDEC) on Aberdeen Proving Ground, MD, for analysis of air space (above the soil in the container) to protect laboratory workers by assuring the absence of mustard agent. After verification of safety, the samples shall be forwarded to the ERDEC laboratory and to the Army Environmental Hygiene Agency laboratory which is also located on Aberdeen Proving Ground.

(b) EPA Samples. Soil samples destined for EPA laboratories shall be held until the air space has been verified by ERDEC, and then shipped to the EPA contract laboratory.

(2) Custody. All chain of custody documentation shall be secured to the inside lid of the cooler. Custody seals may be placed across the lid closure, as appropriate.

d. Sample Processing

(1) Splitting.

a. Soil samples. Soil samples shall be split immediately after collection, thereby permitting concurrent analysis by the EPA contract laboratory, ERDEC, and USAEHA.

b. Water samples Water samples had already been collected prior to the preparation of this plan and, therefore, were processed by the EPA contract laboratory only. Subsequent water samples shall be split to permit concurrent processing by Army laboratories.

#### 4. ANALYTICAL MANAGEMENT.

##### a. Constituents.

(1) Soil Samples. The constituents measured by each laboratory shall be as follows:

(a) EPA Contract Lab

1. BNA (semivolatiles) (see Appendix A)
2. Total metals (see Appendix B)
3. Other site-related contaminants

(b) Edgewood Research Development Engineering Ctr

1. Mustard
2. Extractable Arsenic
3. Total arsenic

(c) U.S. Army Environmental Hygiene Agency

1. Chloroacetophenone
2. Cyanogen chloride
3. Chloropicrin
4. Phosgene
5. Arsenic
6. Mercury
7. Lead
8. Chromium
9. Semivolatiles (BNA)
10. Other Total Metals
11. Explosive Compounds

(2) Water Samples. The constituents measured by the EPA contract laboratory are as follows:

(a) EPA Contract Lab

1. BNA (see Appendix A) (EPA Method 8250/70)
2. Total Metals (see Appendix B) (CLP Method)

b. Quality Assurance

(1) Certification.

(a) EPA Laboratory, Roy F. Weston, has been contracted by the Environmental Protection Agency and meets their quality assurance prerequisites.

(b) Edgewood Research, Development and Engineering Center is recognized as one of the best laboratories for analyzing mustard, lewisite, and adamsite.

(c) U.S. Army Environmental Hygiene Agency has been accredited/certified by:

American Industrial Hygiene Association  
American Association for Laboratory Accreditation  
National Institute of Standards and Technology/  
National Voluntary Laboratory Accreditation Program

States of:

Alabama	New Hampshire
Arizona	New Jersey
California	New Mexico
Delaware	Pennsylvania
Georgia	Rhode Island
Idaho	Tennessee
Iowa	Utah
Kansas	Virginia
Maine	Washington
Michigan	

Environmental Protection Agency:

Region III	Philadelphia, PA
Region V	Chicago, IL
Region VI	Dallas, TX
Region VII	Kansas City, MO
EPA Environmental Monitoring Soils	
Laboratory, Las Vegas, Nevada	

Other Activities:

Participation in NIST/NAVLAP's  
Soil Measurement Proficiency Program

(2) Split Samples. Soil samples shall be split by EPA representatives after collection to permit corroboration of results.

(3) Laboratory Practice. All laboratories shall continue to perform QA/QC procedures in accordance with good laboratory practice.

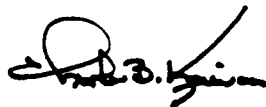
c. Data Evaluation.

(1) Comparison with Criteria. Concentrations of arsenic, mercury, lead, and chromium in the soil from the pit and pile shall be compared to the verification of emergency recovery phase termination criteria using a comparison of the pit/pile sample mean concentration with the established above criteria using a one-tailed t test at the 95% confidence interval in accordance with the EPA guidance provided in Soil Sampling Quality Assurance User's Guide, 2ed, EPA 600/8-89/046.

(2) Comparison with Background. In the event that the site soil arsenic or other metal concentrations exceed the emergency response phase termination criteria, the pit/pile mean concentrations shall be compared to the mean background concentrations using a one-tailed t test at the 95% confidence interval in accordance with the above reference.

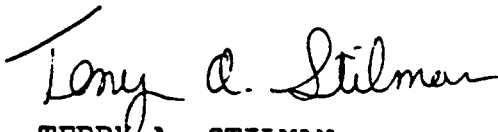
GEORGE E. FRIEL  
BG, USA  
Commander  
Service Response Force

OFFICIAL:



CHARLES B. KENISON  
COL, MS  
Director, Special Staff

APPROVED:



TERRY A. STILMAN  
Federal On-Scene Coordinator  
EPA Region III

BASE NEUTRAL ACID EXTRACTABLES (BNA) OR SEMI VOLATILES  
TCL OR CLP LIST

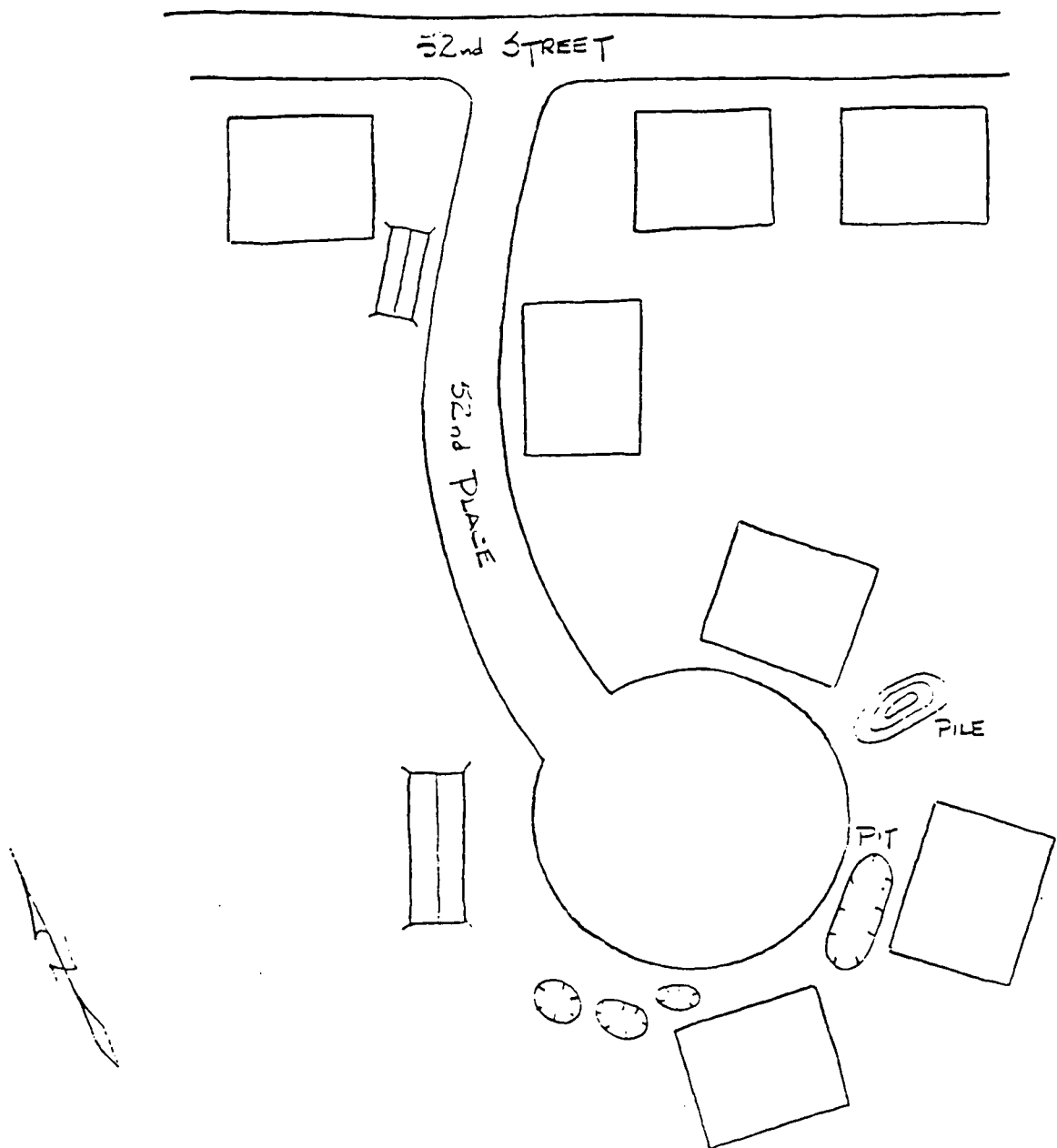
BASE NEUTRAL ACID EXTRACTABLES (BNA) OR SEMI VOLATILES  
PROPERTY POLLUTANT LIST

PCB	3-NITROANILINE	PHENOL	9-NITROANILINE
BIS(2-CHLOROETHYL)ETHER	ACENAPHTHENE	BIS(2-CHLOROETHYL)ETHER	ACENAPHTHENE
2-CHLOROPHENOL	4-NITROPHENOL	2-CHLOROPHENOL	2,4-DINITROPHENOL
1,3-DICHLOROBENZENE	DIBENZOFURAN	1,3-DICHLOROBENZENE	4-NITROPHENOL
1,4-DICHLOROBENZENE	2,4-DINITROTOLUENE	1,4-DICHLOROBENZENE	N-NITROSODIMETHYLAMINE
BENZYL ALCOHOL	DIMETHYLPHthalate	1,2-DICHLOROBENZENE	2,4-DINITROTOLUENE
1,2-DICHLOROBENZENE	4-CHLOROPHENYL-PHENYLETHER	2-METHYLPHENOL	DIMETHYLPHthalate
2-METHYLPHENOL	FLUORENE	BIS(2-CHLOROISOPROPYL)ETHER	4-CHLOROPHENYL-PHENYLETHER
BIS(2-CHLOROISOPROPYL)ETHER	4-NITROANILINE	4-METHYLPHENOL	FLUORENE
4-METHYLPHENOL	4,6-DINITRO-2-METHYLPHENOL	N-NITROBIS(4-N-PROPYLAMINE	4-NITROANILINE
N-NITROBIS(4-N-PROPYLAMINE	N-NITROSODIMETHYLAMINE	HEXACHLOROETHANE	4,6-DINITRO-2-METHYLPHENOL
NITROBENZENE	4-BROMOPHENYL-PHENYLETHER	NITROBENZENE	N-NITROSODIMETHYLAMINE
ISOPHORONE	HEXACHLOROBENZENE	ISOPHORONE	4-BROMOPHENYL-PHENYLETHER
2-NITROPHENOL	PENTACHLOROPHENOL	2-NITROPHENOL	HEXACHLOROBENZENE
2,4-DIMETHYLPHENOL	PHENANTHRENE	2,4-DIMETHYLPHENOL	PENTACHLOROPHENOL
BENZOIC ACID	ANTHRACENE	BENZIDINE	PHENANTHRENE
BIS(2-CHLOROETHOXYMETHANE	DI-N-BUTYLPHthalate	BIS(2-CHLOROETHOXYMETHANE	ANTHRACENE
2,4-DICHLOROPHENOL	FLUORANTHENE	2,4-DICHLOROPHENOL	DI-N-BUTYLPHthalate
1,2,4-TRICHLOROBENZENE	PYRENE	1,2,4-TRICHLOROBENZENE	FLUORANTHENE
NAPHTHALENE	BUTYLBENZYLPHthalate	NAPHTHALENE	PYRENE
4-CHLORANILINE	3,3-DICHLOROBENZENE	HEXACHLOROBUTADIENE	BUTYLBENZYLPHthalate
HEXACHLOROBUTADIENE	BENZO[ANTHRACENE	4-CHLORO-3-METHYLPHENOL	3,3-DICHLOROBENZENE
2-METHYLNAPHTHALENE	CHRYSENE	2-METHYLNAPHTHALENE	BENZO[ANTHRACENE
HEXACHLOROCYCLOPENTADIENE	BIS(2-ETHYLHEXYLPHthalate	HEXACHLOROCYCLOPENTADIENE	CHRYSENE
2,4,5-TRICHLOROPHENOL	DI-N-OCTYLPHthalate	2,4,5-TRICHLOROPHENOL	BIS(2-ETHYLHEXYLPHthalate
2-CHLORONAPHTHALENE	BENZO[FLUORANTHENE	2-CHLORONAPHTHALENE	DI-N-OCTYLPHthalate
2-NITROANILINE	BENZO[FLUORANTHENE	DIMETHYLPHthalate	BENZO[FLUORANTHENE
DIMETHYLPHthalate	BENZO[PYRENE	ACENAPHTHENE	BENZO[FLUORANTHENE
ACENAPHTHENE	NOBONOL 2,3-DIPYRENE	2,6-DINITROTOLUENE	BENZO[PYRENE
2,6-DINITROTOLUENE	DIBENZ[1,2,3-CD]PYRENE		NOBONOL 2,3-DIPYRENE
	BENZO[KLANTHRENE		DIBENZ[1,2,3-CD]PYRENE
			BENZO[KLANTHRENE

List of Chemicals	
Aluminum Antimony Arsenic * Barium * Beryllium Cadmium * Calcium Chromium * Cobalt Copper Iron Lead * Magnesium Manganese Mercury * Nickel Potassium Selenium * Silver * Sodium Thallium Vanadium Zinc	Antimony Arsenic * Beryllium Cadmium * Chromium * Copper Lead * Mercury * Nickel Selenium * Silver * Thallium Zinc
<p><b>Legend:</b></p> <p>CLP - Contract Laboratory Program  HSL - Hazardous Substance List</p> <p>PF - Priority Pollutant  SDWA - Safe Water Drinking Act</p>	

# SPRING VALLEY SITE

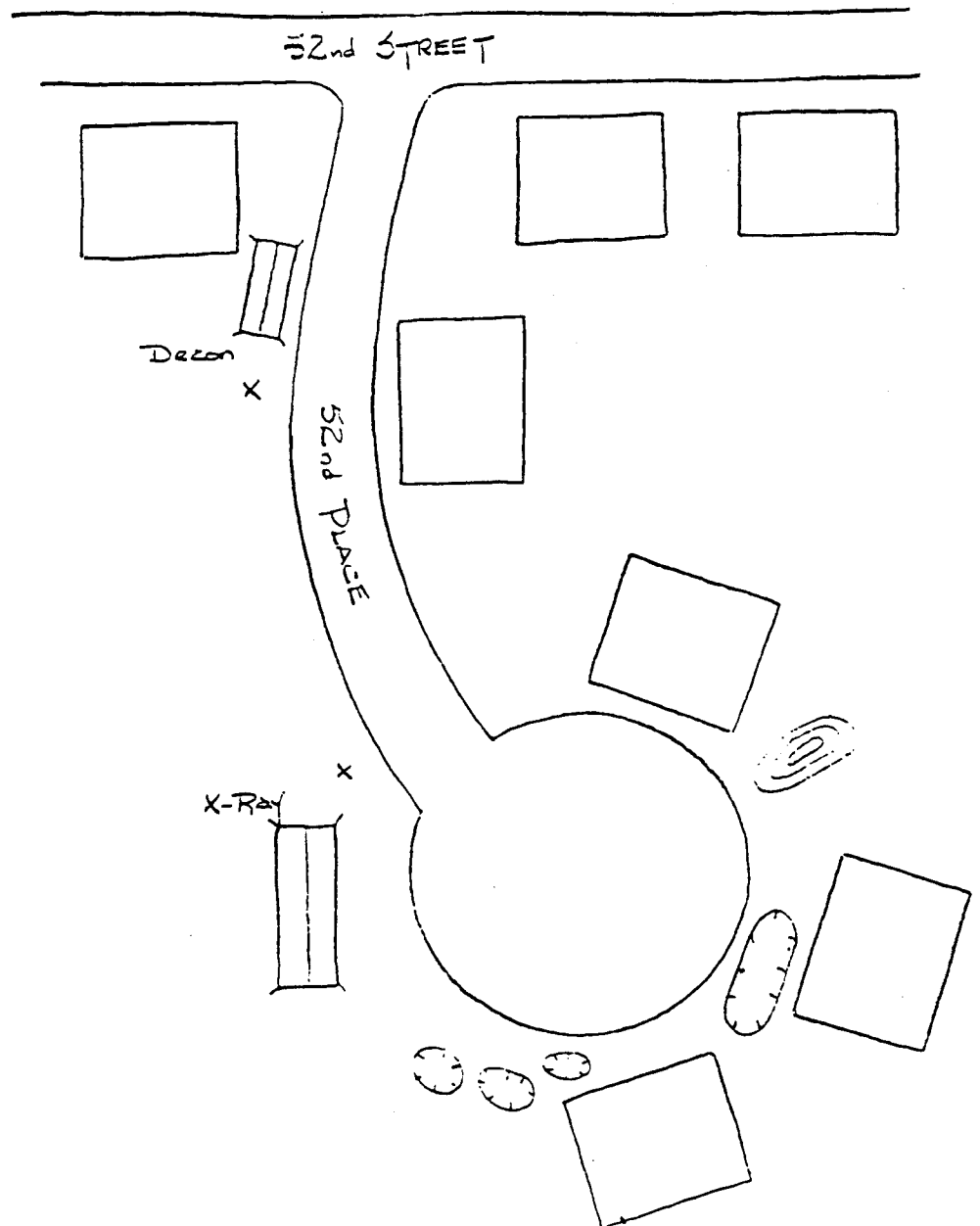
Pit and Pile Samples





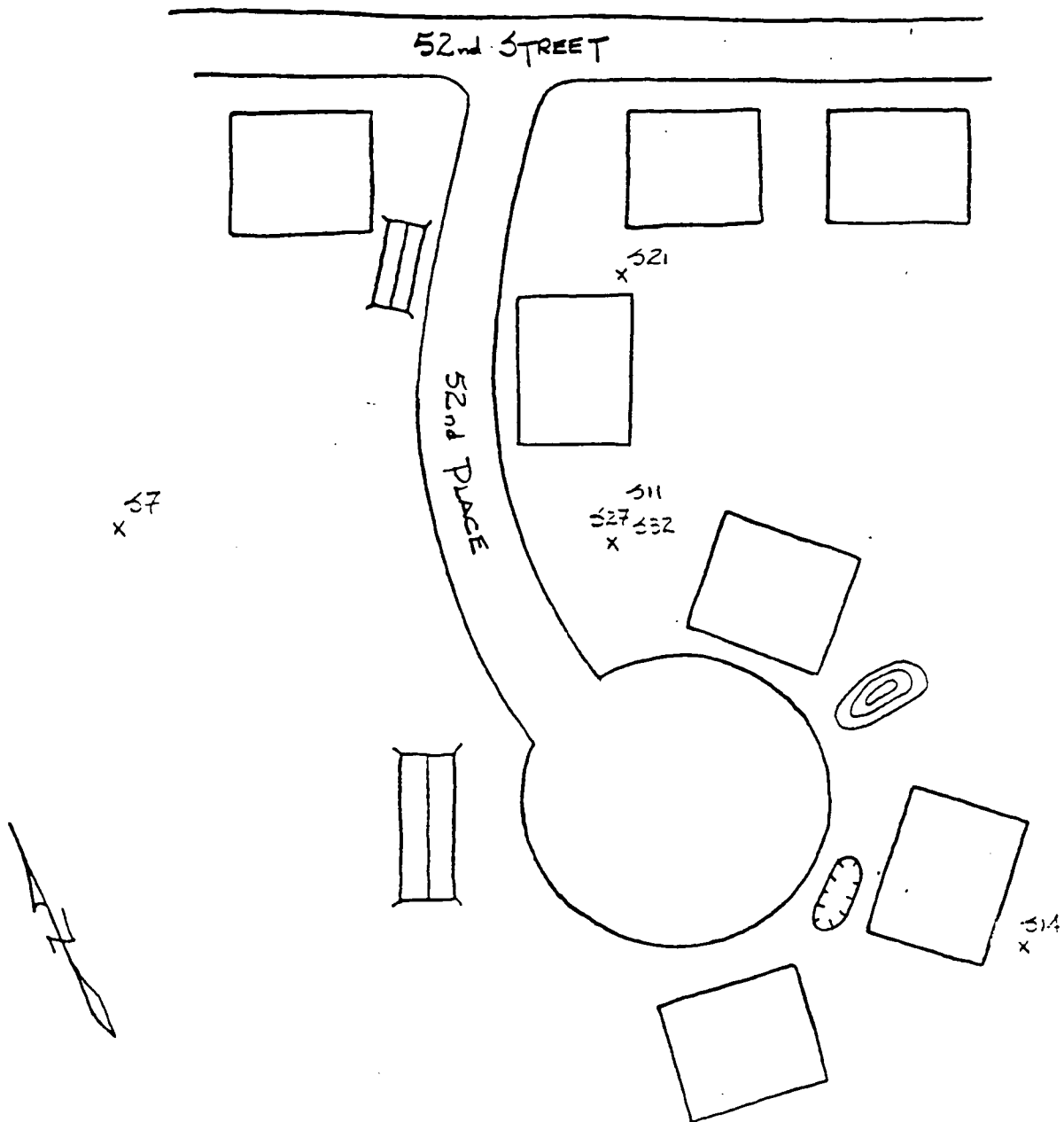
# SPRING VALLEY SITE

Lateral Containment Samples



# SPRING VALLEY SITE

Background Samples



APPENDIX G - VISIT BY MARYLAND DEPARTMENT  
OF THE ENVIRONMENT (MDE) OFFICIALS  
Operation Safe Removal

1. Visitors:

Butch Dye	MDE
Rick Collins	MDE
Jack Roth	APGSA
Bob Silcox	APGSA
Darrell Palmer	USACMDA

2. Schedule: Visit is scheduled for Monday, 25 Jan  
Estimated time of arrival by helicopter is 10:45

11:00 - 11:45 (estimated) - brief in control  
center

11:45 - 12:15 (estimated) - visit site (NOTE:  
request permission for MDE rep to be  
escorted beyond the hotline during TEU  
lunch break. Others in party will remain  
behind the hotline)

12:30 Visitors depart site

3. Purpose: The main purpose for the visit is to provide information to the MDE officials in order to foster their continued support of actions requiring interaction with and/or approval by MDE. Mr. Palmer is included because he has served as the primary liaison between Operation Safe Removal and the MDE during the last 2 weeks. Mr. Silcox and Mr. Roth are included as representatives of the Commander, APG who holds the hazardous waste permit at APG.

4. Briefings:

COL Read	<ul style="list-style-type: none"><li>o Overview of Site History</li><li>o Events of 5-11 Jan</li><li>o Brief Description of Current Operations</li><li>o Status of Found Rounds</li><li>o Projection for Future Operations</li></ul>
Dr. Gus McCaffrey	<ul style="list-style-type: none"><li>o Brief discussion on PINS technology</li></ul>
Tim Blades	<ul style="list-style-type: none"><li>o Discussion of Sampling On-Site</li><li>o Discussion of Previous Action Drilling, Sampling and Analyzing 3 Rounds at Edgewood</li></ul>
Mr. Bacon	<ul style="list-style-type: none"><li>o Request to Transport Additional Rounds to ERDEC</li></ul>

Operation Safe Removal

25 Jan 93

Subject: Visit by MDE Officials/Approval to Ship Rounds to ERDEC

1. Visitors:

Butch Dye	MDE
John Fairbank	MDE
Jack Roth	APGSA
Bob Silcox	APGSA
Darrell Palmer	USACMDA

2. Visitors arrived at approx 1035 hrs on Monday, 25 Jan. They were briefed on the operation by COL Read, Mr. Bacon, Dr. McCaffrey, and Tim Blades. Butch Dye was escorted to the site by Tim Blades. The others remained behind the hotline.

3. MDE visitors were requested to approve shipment of approximately 5 additional rounds to ERDEC for drilling, sampling, and analysis. At the conclusion of the visit, Mr. Dye indicated that may ship additional rounds to ERDEC within the limits explained in the briefing and previously agreed to :

- up to 5 rounds
- non-explosively configured
- air transportation
- operation conducted in the CTF
- MDE notified of results and plans for disposition

In addition, he asked that we notify him before making such a shipment. He left his home phone number and pager number to facilitate the notification.

*Teresa M Mann*

## APPENDIX H - LESSONS LEARNED

### OPERATION SAFE REMOVAL

Subject: Lessons Learned

#### 1. Disposition of Unsafe Rounds.

a. Issue, Deficiency, or Problem: We do not have a location where a round determined to be unsafe for transport could be treated.

b. Resolution/Recommendation: Identify proposed procedures and locations for dealing with serious emergency situations such as rounds that are not safe to store or not safe to transport. Make local environmental authorities aware that such a situation may occur.

#### 2. Planning for Disposition of All Possible Fills.

a. Issue, Deficiency, or Problem. Specific: The emergency permit for detonation of rounds at FT AP Hill is limited to two types of rounds, HE and WP. Upon final review of the list of rounds, two additional types of rounds were recommended by the Cdr, TEU for open detonation; possible smoke filled and nearly empty chemical filled.

b. Discussion. The permit application included only two fills which were initially identified as candidates for demolition - WP and HE. It may have been easier to request more fills earlier and remove unnecessary ones than to try to add fills later. Regulators are very strict about limiting activities to those listed on the permit only.

c. Resolution/Recommendation. Recommend identifying all possible fills early in the event, discussing the situation with potentially involved environmental regulators early in the event, and attempting to obtain required environmental permits to allow disposition of all possible fills. Effective communication between TEU and environmental representatives on site early and throughout the event is essential to assure problems are not encountered later.

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Appendix I  
List of Equipment

Equipment to be Brought to SRF:

Gas Mask

Laptop computer with WordPerfect

Printer

ERDEC Phone Book

Copy of Federal Hazardous Waste Regs (40 CFR 261 et seq)

Blank



APPENDIX J - POINTS OF CONTACT  
Operation Safe Removal

Phase I Environmental POCs - On Site

Terry Mann  
Environmental Coordinator, ERDEC  
ATTN: SCBRD-ODR-E  
APG, MD 21010-5423  
(410) 671-4614

Dan Wenz  
ATTN: SCBRD-ODR-E  
APG, MD 21010-5423  
(410) 671-2221

ROLE: Assisted the environmental coordinator in preparing hazardous waste manifests for shipments to PBA and Ft AP Hill and in arranging for disposal of miscellaneous wastes by Chem Waste Management.

Phase I Environmental POCs - Off Site

Wendell Fortner  
Environmental Coordinator  
Pine Bluff Arsenal  
10020 Kabrich Circle, ATTN: SMCPB-EM  
Pine Bluff, AR 71602-9500  
(501) 540-2819

ROLE: Interfaced with Arkansas regulators to secure a permit modification for storage of suspect agent rounds and a permit for transportation of hazardous waste in Arkansas. Provided manifest forms and information for preparation of hazardous waste manifests for items sent to PBA.

Philip Vick  
Pine Bluff Arsenal  
10020 Kabrich Circle, ATTN: SMCPB-EM  
Pine Bluff, AR 71602-9500  
(501) 540-2810

ROLE: Same as above.

Terry Banks  
Environmental Coordinator  
U.S. Army Garrison, Ft A.P. Hill  
ATTN: AFKA-FHE-E  
Bowling Green, Va 22427-5000  
(804) 633-8255

ROLE: Interfaced with Virginia regulators to secure a permit for open detonation of suspect HE/WP rounds. Served as environmental liaison at FT AP Hill for detonation actions. Observed detonations and provided reports to regulators.

Garwin W. Eng  
Environmental Engineer Senior  
Office of Compliance and Enforcement  
Virginia Department of Waste Management  
101 North 14th Street  
Richmond, VA 23219  
(804) 786-6004

ROLE: Served as point of contact at Virginia Department of Waste Management for open detonation permit and amendment. Reviewed information submitted with the application and recommended action to higher authorities.

Steve Frazier  
Virginia Department of Waste Management  
101 North 14th Street  
Richmond, VA 23219  
(804) 225-2708

ROLE: Due to background in explosives, served as POC at Virginia Dept of Waste Management for questions/issues dealing with explosives. Provided guidance on proper shipping name for hazardous waste manifests.

Mr. Ghirmay Berhe  
Hazardous Waste Management Branch  
Government of D.C.  
Environmental Regulation Administration  
2100 Martin Luther King, Jr Ave, SE  
Washington, DC 20020  
(202) 404-1167

ROLE: Issued generator id number and temporary transportation id number verbally and sent followup paperwork.

Darrell Palmer  
USACMDA  
(410) 671-4199

ROLE: Served as primary POC with State of Maryland Department of the Environment.

Ken Stachiw  
Chief, Environmental Quality Div  
Cdr, APG  
ATTN: STEAP-SH-EW  
APG, MD 21005  
(410) 278-5773

ROLE: As APG Environmental Coordinator, served as APG POC for request to bring sample rounds to APG for analysis.

Jack Roth  
Executive Officer, APGSA  
APG, MD 21005  
(410) 278-4005

ROLE: Assisted in interface with MDE officials to gain approval to bring sample rounds to APG for analysis.

Ed Sims  
Cdr, USAAPGSA  
ATTN: STEAP-SH-EW  
APG, MD 21005  
(410) 671-2157

ROLE: As COR on the Chem Waste Management contract, made all contractual arrangements for disposal of scrap metal, spent decon solution, and disposable PPE.

Harold (Butch) Dye  
Maryland Department of the Environment  
Broening Hwy  
Baltimore, MD  
(410) 529-9127

ROLE: MDE Official who approved shipment of 9 rounds to ERDEC for drilling, sampling, and analysis.

Blank

# LEGAL

1 February 1993

## LEGAL AFTER ACTION REPORT

### 1. PURPOSE:

#### a. Introduction and Background.

(1) Legal support was provided to the SRF by LTC Michael K. Millard, Deputy Staff Judge Advocate, and LTC Warren G. Foote, Assistant Staff Judge Advocate, Office Of the Chief Counsel and Staff Judge Advocate, U.S. Army Test and Evaluation Command.

(2) LTC's Millard and Foote had provided legal support and advice for previous legal support for USACBDA, SRF, and CSEPP exercises. They were activated for Operation Safe Removal after coordination with USACBDA, AMC, and TECOM.

(3) LTC Millard was given an initial heads up for activation on 6 Jan 93, and early coordination and planning for legal support was begun on that day. Activation for the project was confirmed on 8 Jan 93, two days before departure on 10 Jan 93.

(4) Neither attorneys had a protective mask before activation. Each officer was issued a protective mask after arrival to the on-site operations center.

(5) LTC Millard served as the SRF Legal Advisor; LTC Foote served as the SRF Environmental Attorney.

(6) After reporting on-site, the legal section was assigned to the Special Staff Section, under COL Kenison.

(7) As the SRF Legal Adviser, LTC Millard provided legal advice and support to the SRF Commander and Staff on a broad range of issues, to include administrative law, acquisition law, tort liability and claims, finance and funding issues, tax exemption status, security and posse comitatus. LTC Foote provided legal advice and support primarily on environmental issues, but also on posse comitatus., commander's exposure to liability, and tort liability. Both lawyers were frequently used to accomplish staff actions not purely related to legal matters. A Legal Issues List is attached as Enclosure 1.

(8) LTC's Millard and Foote reported to HQ, USACBDA on 9 January, 1993. They departed for the site, with the bulk of the SRF Staff, from HQ, USACBDA, on 1300 hours, 10 January 1993, and arrived at the site on about 1530 hours.

(9) The normal onset work location was in the Special Staff Section, Operations Center, SRF, in Spring Valley, Washington, D.C..

(14) Government provided transportation was used for travel to and from the work-site to the hotel. Some meetings we attended required government travel to the nearest Metro station, from where we took trains to the Department of Justice or the OTJAG Environmental Law Division.

(15) Equipment that was necessary include:

(a) Telephone. A dedicated phone for the legal section was received on about 14 January. This also allowed the legal section to use LEXIS computer research service via the modem on the portable computer.

(b) A portable computer with printer was brought to the work-site by LTC Millard on 10 January, and remained on-site throughout the operation. The computer, a Zenith Data Systems 286 laptop was considered too heavy to bring back and forth each day. Both the computer and printer (an ALPS ASP100) were considered too slow.

(c) A long work table was received on 10 January, with 3 chairs.

(d) Access to the FAX in the Operations Center was of critical importance, as coordination required both sending and receiving telefax communications.

(16) An additional computer and faster printer would have facilitated the delivery of legal services to the SRF, but is not a mission essential requirement. A larger support staff could also have provided typing support to the various staff elements. Support organizations were relied upon to provide chemical protective gear.

(17) Previous experience with CSEPP exercises and familiarity with chemical surety regulations as well as administrative and environmental law were invaluable preparation. Participation in an exercise geared towards recovery and site remediation would have provided valuable training with directly applicable lessons learned.

(18) No other legal advisors were needed on site. Many other Judge Advocates and other lawyers in the Washington, D.C. area provided valuable telephonic assistance and made site visits, as necessary. Had this operation been conducted at a more remote site, an acquisition law specialist (as well as a contracting officer with sufficient warrant to provide direct contracting support) would have been a valuable addition to the team. If a decision had been made to operate around the clock, an additional lawyer would have been necessary to man the night shift.

(19) LTC's Millard and Foote were deactivated on 26 January 1993. They left the site on 23 January, with LTC Foote returning on 25 January for the day, and with LTC Millard remaining in telephonic contact at his home office.

b. Objectives.

(1) Provide legal advice and assistance to the Commander, SRF, and staff.

(2) Organize and supervise the performance of the legal element at the SRF site.

(3) Coordinate the operations to process requests for reimbursement of local resident evacuation expenses and claims with the U.S. Army Claims Service, MDW Office of the Staff Judge Advocate, the Army Environmental Law Division, and the Office of Chief Counsel Baltimore District, and Office of General Counsel, Corps of Engineers.

(4) Establish channels for coordination of technically complex legal matters with higher headquarters and the principal legal advisors of other participating Federal departments and agencies, to include DAJA-IO (International and Operations Law Division); JALS-EL (Environmental Law Division); HQ, TECOM Office of the Chief Counsel and Staff Judge Advocate; AMC Office of Command Counsel; Office of Staff Judge Advocate Military Traffic Management Command, Corps of Engineers Office of Chief Counsel; the Department of Justice (DOJ), Torts Branch, and the DOJ Criminal Division; EPA Region III Office of Counsel; and the Army Claims Service.

(5) Establish liaison with the Corporate Counsel for the District of Columbia, as well as the U.S. Bureau for Alcohol, Tobacco and Firearms, the Secret Service, the Federal Bureau of Investigation, and the District of Columbia fire and police department and the District of Columbia's Office of Emergency Preparedness.

(6) Provide legal coordination and assistance to other military, Federal, and local officials upon request.

(7) Review operational and safety plans to ensure they are sufficient to meet legal requirements. Particular emphasis was placed on issues concerning environmental compliance, security, posse comitatus., and documentation of facts for use in potential claims, litigation or possible criminal investigation.

## 2. OPERATIONAL SUMMARY:

### a. Initial TEU Phase (5 - 6 Jan 93)

(1) Activation. The TECOM Office of Chief Counsel and Staff Judge Advocate was given a heads up on 6 Jan 93 that it may be tasked to provide legal support for the Spring Valley Operation if a Service Response Force were to be activated.

(2) Response. The Initial Response Force (IRF) legal support was provided by the Office of the Staff Judge Advocate, Military District of Washington. That office telephonically coordinated with CC/SJA TECOM on 7 and 8 Jan 93 to ensure SRF legal advisors were appraised of potential legal issues.

### b. SRF Phase (7 Jan - 2 Feb 93)

(1) Activation. LTC Millard and LTC Foote attended staff meetings at HQ, USACBDA, on Saturday, 9 Jan 93, and arrived on-site on 10 January.

(2) Coordination. Legal coordination was made with the other staff elements of the SRF, as well as legal staffs in HQ, AMC, the Environmental Law Division (JALS-EL), the Army Claims Service, the International and Operational Law Division, the SJA for MTMC (Military Traffic Management Command), the SJA for the Military District of Washington, the Office of Corporate Counsel for the District of Columbia, and the Dept. of Justice.



(10) Legal affairs. Initial efforts focused on posse comitatus related issues, characterization of the recovered munitions as hazardous waste, pursuant to RCRA, and establishing a procedure to process possible claims, as well as determining which command or agency would process claims requests. It took some time early in the operation for the staff to adjust to the presence of legal advisors, and to sort out their role. As the operation progressed, the legal section drafted an declaration of emergency for the Mayor, continued to work on claims and tort, and CERCLA liability issues, reviewed safety and operational plans, drafted the action memorandum which is required by the National Contingency Plan, which was filed with the EPA, worked a variety of environmental law issues, requests for reimbursement by the District of Columbia and the EPA, tax exemption status, TDY limits, and a variety of fiscal and contract law questions.

(11) LTC Millard and LTC Foote were deactivated on 28 January. LTC Foote returned to the site on 1 February.

### 3. OBSERVATIONS AND RECOMMENDATIONS:

a. Lessons Learned (see Appendix).

b. Unresolved Problems.

1) The District of Columbia may still seek "reimbursement" for expenses incurred during the Operation in excess of what is authorized by 40 C.F.R. 310.05.

2) Emergency permits were obtained, with difficulty, to transport, store, and treat the munitions as hazardous waste from the States of Virginia and Arkansas, as well as coordinating the shipment of samples to Maryland for testing and analysis. The Army needs permitted facilities and transport for hazardous waste to handle future recoveries of non-stockpile chemical munitions.

3) Reimbursement procedures were implemented by the Corps of Engineers for those voluntarily evacuated. It remains to be determined whether there will be subsequent claims filed with the Army, and whether there will litigation which joins the Army as a defendant.

c. Conclusion. A wide variety of legal issues were resolved on-site by the two Army lawyers. Integrating the lawyers into the SRF staff on-site helped the lawyers understand the problems first hand, and facilitated the timely and responsive delivery of legal services. The legal affairs team made an important contribution to accomplishing the mission.

MICHAEL K. MILLARD  
LTC, JA

WARREN G. FOOTE  
LTC, JA

1 February 1993

## Lesson Learned -- Transport and Storage of Recovered Munitions

1. ISSUE: The Army must resolve the systematic problem of establishing transport and storage standard procedures and adequate permitted facilities to

## 2. DISCUSSION:

a. Underground disposal of munitions and related material from 1917 to 1919 in the vicinity of American University by the Research Division of the Chemical Warfare Service has resulted in extended emergency removal and restoration efforts.

b. Munitions recovered from the burial pit were properly characterized as hazardous waste, in accordance with RCRA. There can be little doubt that munitions buried in 1919 are inherently waste-like material that have entered the waste stream. Nevertheless, due to political considerations, the State of Arkansas tried to persuade Army representatives at Pine Bluff not to seek a hazardous waste permit. Although a hazardous waste permit was ultimately granted to store the munitions as hazardous waste at the Arsenal, the message from the State seemed to be that this time may be the last time such shipments will be allowed. This state of affairs will drive the operators to seek to rationalize a way not to characterize recovered munitions, even when buried, as hazardous waste. This "fix" will delay finding a long term solution, and expose operators and transporters to criminal liability.

c. The EPA has granted regulatory authority to the states under RCRA to manage hazardous waste. Receipt and storage of hazardous waste for ultimate incineration is not a politically acceptable outcome for any state.

d. The EPA's emergency coordinator suggested that the EPA could withdraw state authority to regulate munitions which are hazardous waste if it was confronted with the problem. Right now, the EPA does not perceive that there is a problem.

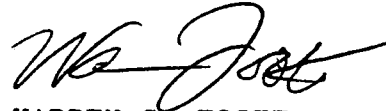
e. The Army should decide upon a standard procedure on how to transport and store recovered chemical and other munitions which could be characterized as hazardous waste. Coordination of the procedure should be coordinated with USACBDA; USACMDA; HQ, AMC; HQ, TECOM (Office of the Chief Counsel); the Environmental Law Division (JALS-EL); and the Office of the Army General Counsel.

f. Once a procedure is established, the Army could attempt to effect a change in the law through Mr. Walker's office (Deputy Assistant Secretary of the Army for Installations, Logistics, and the

Apr 8

Environment), establishing a federal regulation that will allow the transport and storage of chemical non-stockpile material without the need for state approval.

3. CONCLUSION: A proposed standard procedure for the transport and storage of recovered chemical non-stockpile material should be staffed for final approval by Mr. Walker, with the recommendation that his office forward the procedure to the EPA for approval and implementation.



WARREN G. FOOTE  
LTC, JA  
Special Staff (Legal)

OPERATION SAFE REMOVAL  
Spring Valley Munitions Removal  
Legal Issues List

1. Can the Army feed non DOD personnel who are part of the Federal Response Force Coordinator/Service Response Force Commander's emergency response force?
2. What are the legal implications of the Army providing a statement describing the emergency situation, where the statement will be used by the resident for insurance purposes?
3. What are the legal implications of the size, shape, distance, direction, and duration of the hazardous safety zone created around the munitions site?
4. Who has, and what is the legal authority to evacuate residents from the area around the munitions site?
5. What is the legal recourse if residents fail to voluntarily evacuate?
6. Does the Army incur increased liability if removal work continues despite refusal of all residents to voluntarily evacuate from the hazard zone [and an accident occurs]?
7. Who is responsible for paying the incidental expenses of residents resulting from evacuation during removal operations?
8. What are the applicable transportation requirements of the Department of Transportation and the Department of Defense related to the air transportation of liquid and high explosive filled commodities?
9. What are the legal implications of using the local developer's front-end loader to remove top soil above and around the munitions site? What if the equipment is later contaminated? Alternatives?
10. What are the legal requirements and procedures to obtain emergency permits from Arkansas, Maryland, and Virginia to transport, store, and dispose munitions and other material removed the site?
11. What information should be provided to the SRF Commander concerning potential Army liability so he can be better prepared to address concerns of local residents?
12. Who will be responsible for processing liability claims arising out of this incident?
13. What are the procedures to affect an emergency contract with a technical expert needed by Technical Escort Unit to help evaluate and assist with removal operations?

14. Is Transportation Plan legally sufficient?
15. Is Hazardous Risk assessment legally sufficient?
16. What is the legal status of the developer's equipment (backhoe, etc. ) left on site, and can it/should it be released back to the contractor?
17. Should the spent decon solution and discarded outer equipment be treated as hazardous waste?
18. What are the disposal standards for spent decon solution, personal clothing and equipment, and heavy equipment used on the site?
19. Is the health hazard fact sheet prepared by the SRF Surgeon legally sufficient?
20. What is the propriety/advisability of providing information about chemicals discovered at the site to the developer's attorney?
21. What is the potential for toxic tort liability arising from operation?
22. How will traditional claims be processed?
23. Is the Operation Safe Removal Operation Plan legally sufficient?
24. What are the legal/regulatory requirements for packaging materials for commodities to be shipped from the site?
25. What coordination is required before shipment of high explosive and liquid filled munitions?
26. Are plans for an alternative SRF site/EOC legally sufficient?
26. What are the requirements and constraints concerning release of information to residents, press, and other interested parties?
27. What are the legal implications and requirements for shipping 3 "sloshing" munitions to APG, MD, for test and analysis?
28. Under what circumstances may the SRF surgeon provide medical assistance to non-DOD civilians in the evacuation area?
29. What are the legal implications of using military investigators to question a civilian who reportedly found a munition (possibly from the site) and brought it to Montgomery County, MD?

30. What are the legal implications of coordination with private attorneys representing local residents and the developer?
31. What are the legal requirements for advising the National Response Center of a release or threat of chemical release? What information should be provided to the NRC during Operation Safe Removal to ensure compliance with 40 CFR 302(6)?
32. What is the legal significance of signs, found during excavations at the site, which indicate the presence of poison gas? How should the signs be preserved as evidence?
33. What are the legal implications of obtaining a list of names, addresses, and telephone numbers of evacuated residents of Spring Valley?
34. What limitations [Posse Comitatus Act] and guidelines are applicable for the use of military forces to provide protection and security around the site? Provide emergency evacuation assistance in the event of an accidental explosion or release?
35. What RCRA requirements must be complied with to transfer, store, and dispose of materials recovered from the Spring Valley site?
36. What coordination should be affected with the District of Columbia Office of Emergency Preparedness and Corporation Counsel?
37. How should non-DOD government agencies seek reimbursement for expenses incurred during Operation Safe Removal? Should local agencies be provided with a copy of 40 C.F.R. 310 concerning EPA claims for exceptional response costs associated with hazardous substances releases?
38. What is the legal significance of a state agreeing to allow materials to enter as "samples," but not as "hazardous materials?"
39. Do any community advisory press releases contain matters which would inappropriately raise any liability issues?
40. Are Phase I operations within the emergency exceptions of AR 200-2 such that EA's and EIS's are not required?
41. Does CERCLA cleanup require NEPA integration?
42. Do OSHA requirements apply to DOD emergency actions? Are military unique operations and work places exempt from OSHA requirements? which safety requirements apply?
43. Is the emergency evacuation community advisory legally sufficient?

44. Does 40 C.F.R. 300.800, concerning selection of response action, apply to emergency removal actions like Operation Safe Removal?
45. What should be recommended to the Corps of Engineers concerning policy, procedures, and guidelines for reimbursement of reasonable evacuation expenses?
46. What are the legal implications of a National Defense Area? Should an NDA be established on the site of Operation Safe Removal?
47. What should be the contents of a letter from the SRF Commander to the D.C. Mayor to formally request the declaration of a community emergency? What will be the effects of such a declaration? What should the declaration state? Is it appropriate for the declaration from D.C. to tie parameters and end of the emergency evacuation to decisions of the SRF commander?
48. What is the legal basis for the appointment of the Army (DOD) as the "lead agency" for the emergency response under CERCLA?
49. What is the legal significance of tailoring the SRF to less than that called for in the National Contingency Plan (NCP)?
50. Under CERCLA and other guidelines, of what should the administrative record consist?
51. How does the SRF close out Phase I? Who will certify and verify that the site is clean? How?
52. How do we identify and define the environmental status of buried munitions? Are the hazardous waste, hazardous substances, etc.?
53. Is the document created to record the decision for a response action under 40 C.F.R. 300.800 legally sufficient?
54. What is the legal significance of plastic (clearly not from original 1918-1919 burial) being found at the site of the buried munitions? How should the plastic be preserved as evidence, and how should its finding be documented?
55. Should the SRF forces be exempt from D.C. hotel taxes? How should the exemption be documented?
56. What are the procedures for removing the TDY cap so that SRF members will not incur unreimbursed expenses? What else can be done to ensure SRF responders do not depart with unreimbursed expenses associated with the emergency deployment?

57. What legal problems are associated with cracking munitions at the destruction site at A.P. Hill, VA, to learn the contents, and then destroying in place [all non-intrusive examinations reflect the munitions do not contain chemicals]?
58. How should gifts to the SRF be treated? What are the rules for acceptance of gifts?
59. Can Army Chaplains be used to counsel Spring Valley residents?
60. What information should be provided through technical legal channels to OTJAG, MDW, Environmental Law Division, and U.S. Army Claims Service?
61. What is the potential for Army tort liability?
62. Who are the potential responsible parties under CERCLA?
63. What concerns should the SRF Commander have in addressing the public about the possibility of Army liability/responsibility?
64. What is the legal significance of how priorities of work are established for Phase II?
65. What is the exposure of the SRF Commander to personal liability?
66. What Federal statutes prohibit possession of explosives?
67. What Federal agency has law enforcement jurisdiction over explosives? To which Federal and local agencies should the SRF report evidence that the developer's employees may have removed or secreted potential explosives?
68. May the SRF Commander offer an amnesty turn-in program for munitions recovered by construction workers and residents? Is coordination with DOJ or D.C. agencies required?
69. How can the Army fix the long term problem of establishing environmental permits for transportation and storage for removed munitions which are hazardous waste?
70. May PINS (the Portable Isotopic Neutron Spectroscopy) be stored on site? Is the leased building serving as the SRF CP considered "government property" for storage purposes?



71. What is DERP (Defense Environmental Restoration Program) and DERA (Defense Environmental Restoration Account) and how do SRF costs get applied to those funds?

72. May the EPA receive reimbursement for costs incurred for split soil sample analysis done at the Army's request?

73. What type of clauses should be included in a release, signed by residents, to limit Army liability while enabling the Corps of Engineers to "sweep" parcels of land as part of Phase II?

74. What should be done by SRF cleanup and transition forces to best limit claims arising out of direct damage to property used by emergency response forces?

75. What documents are required to be included in the administrative record that form the basis for the selection of the response action under the National Contingency Plan.



WARREN G. FOOTE  
LTC, JA  
SRF Environmental Law Advisor



MICHAEL K. MILLARD  
LTC, JA  
SRF Legal Advisor

11 January 1993

## Transport Requirements for Hazardous Waste

1. ISSUE: What are the transport requirements for air transport of hazardous waste.

2. DISCUSSION: Transport of hazardous waste requirements.

a. RCRA is implemented by federal regulation, and includes the following requirements:

1) Hazardous waste must have an EPA identification number prior to transport, 40 C.F.R. 263.11. In addition, Army Reg. 50-6, chapter 4, specifies packaging and labeling requirements, assignment of technical escort and security personnel, and transportation by military aircraft. Other notification requirements of Army Reg. 50-6, para. 4-2a, do not apply in an emergency.

2) Hazardous waste must be accompanied by a manifest before it can be accepted from a generator for transport. The transporter must sign and date the manifest acknowledging acceptance of the hazardous waste, 40 C.F.R. 262.20, 49 C.F.R. 172.205 (DOT).

3) The generator must designate on the manifest one facility which is permitted to handle the waste described on the manifest, 40 C.F.R. 262.20(b).

4) Hazardous waste may only be transported to a storage or disposal facility that has an EPA or state permit for that type of waste. A temporary emergency permit to a non-permitted facility may be issued. This permit may be oral or written and is valid for no longer than 90 days. The permit must clearly specify the hazardous waste to be received and the manner and location of their treatment, storage, and disposal, 40 C.F.R. 270.61.

5) The transporter must keep a copy of the signed manifest, 40 C.F.R. 263.22.

6) In the event of a discharge of hazardous waste during transport, certain immediate actions are required, to include notice to the National Response Center. Immediate removal may be authorized if necessary to protect human health or the environment,

## Transport Requirements for Hazardous Waste

40 C.F.R. 263.30 and 49 C.F.R. 171.3(d) (DOT).

7) The EPA has expressly adopted certain regulations of the Dept. of Transportation (DOT) governing the transportation of hazardous materiel, 40 C.F.R. 263.10.

### b. DOT regulatory requirements:

1) Hazardous materiel may be transported by air if it is packaged, marked, labeled, classified, described and certified on a shipping paper and otherwise in a condition for shipment as required by DOT Technical Instructions, 49 C.F.R. 171.11. For any waste that exhibits an EPA characteristic of ignitability (White Phosphorus), reactivity, corrosivity, or toxicity (Lexisite), the letters EPA followed by the appropriate description is required, 49 C.F.R. 171.11(d)(1)(i)(C).

2) In the event of an incident during transport of hazardous materials, certain reporting requirements must be met, 49 C.F.R. 171.15.

3) The hazardous waste manifest satisfies the requirement for DOT shipping papers, as described in 49 C.F.R. 172.200 - .203. This has been coordinated with Evans Scranton, DOT inspector, (717) 346-4949, and Kevin Koob, EPA On Scene Coordinator, EPA Region III, (215) 597-9355.

4) The air transporter must certify that the contents of the shipment are accurately described, classified, packed, marked, labeled, and in proper condition for air carriage, 49 C.F.R. 172.204(c).

CONCLUSION: Recovered chemical munitions should be transported and stored as permitted hazardous waste.

WARREN G. FOOTE  
LTC, JA  
AMSTE-JA  
Special Staff (Legal)

AMSTE-JA (27)

21 January 1993

MEMORANDUM FOR Program Manager for Chemical Demilitarization,  
Environmental & Monitoring Division, ATTN:  
SFIL-CME-N (MAJ DeWitt) Aberdeen Proving Ground,  
Edgewood Area, MD 21020-5401

SUBJECT: NEPA Requirements for Spring Valley Remediation

1. This responds to your request for legal guidance concerning NEPA requirements for the Phase I emergency response at Spring Valley, Washington D.C., and the Phase II remedial investigation/feasibility study and cleanup conducted by the Baltimore District of the Corps of Engineers. I conclude that NEPA documentation is not required for either Phase I or Phase II operations at Spring Valley.
2. Phase I emergency response activities do not require environmental analysis pursuant to NEPA. Paragraph 2-3b, Army Reg. 200-2 provides that in an emergency, the Army may take immediate actions that have environmental impacts for the purpose of protecting life or property. The actions conducted by the Service Response Force in Phase I fall within this exception.
3. The Defense Environmental Restoration Program (DERP) provides centralized management for the cleanup of DOD hazardous waste sites consistent with the provisions of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). DERP applies to Phase II operations at Spring Valley. All the requirements of NEPA are met in the CERCLA process, which is the functional equivalent of NEPA. No separate documentation for NEPA compliance is required while conducting the Phase II investigation/study and cleanup response at Spring Valley. Certain features of NEPA will be included in the remedial investigation/feasibility study. The management of this process, however, falls within the responsibility of the Baltimore District Engineer.



WARREN G. FOOTE  
LTC, JA  
Assistant Staff Judge Advocate

22 January 1993

## Commanders' Potential for Personal Liability

1. ISSUE: Is the SRF Commander or the Commander of Technical Escort exposed to personal liability by not following OSHA standards and Army safety policies regarding protective clothing.

### 2. DISCUSSION:

a. OSHA regulations are not enforceable against the Army by the Dept. of Labor. See 29 C.F.R. 1910.2(c), which excludes the United States from its definition of "employer."

b. Executive Order 12190 of February 26, 1980, directs the head of each agency to operate an occupational safety and health program in accordance with the requirements of the Executive Order. This Order does not apply to "military personnel and uniquely military equipment, systems, and operations."

c. Army Reg. 385-10 states: "Commanders will apply OSHA and other non-DA regulatory or consensus safeguards and health standards to military-unique equipment, systems, operations, or workplaces, in whole or in part, insofar as practicable."

d. As a general rule, government officers who perform discretionary functions within the scope of their duty are not exposed to personal liability. This extends to a commander's decision as to the level of protective equipment soldiers and employees should use during operations. Decisions which are outside the scope of duty, or grossly or willfully negligent subject the culpable party to personal liability.

3. CONCLUSION: OSHA standards provide a guide for establishing employee safety standards in environmental remediation, but these standards are not enforceable against the Army. Although Army safety regulations provide specific guidance and apply OSHA safety standards, commanders have the discretion to specify the appropriate protective measures that are to be taken. The exercise of this inherently discretionary function does not expose commanders to personal liability.

WARREN G. FOOTE  
LTC, JA  
AMSTE-JA  
Special Staff (Legal)

1. Name: LTC Warren G. Foote

22 January 1993

2. Agency: AMSTE-JA

3. Section: Special Staff (Legal)

4. Report:

a. Issue: May the Portable Isotopic Neutron Spectroscopy Chemical Assay System (PINS) be stored on-site?

b. Discussion:

1) The use, possession and transfer of nuclear by-product material is prohibited by statute unless a license has been granted by the Nuclear Regulatory Agency (NRC), 42 U.S.C. Section 2111. There are, however, certain exemptions to the licensing requirement that may apply in accordance with NRC regulations.

2) Prime contractors of the Dept. of Energy (DOE) are specifically exempted from the licensing requirements for most purposes, see 10 C.F.R. 30.12. Idaho National Engineering Laboratory (EG&G) is a DOE prime contractor.

3) The DOE exemption applies to the "performance of work for the Department [DOE] at a United States Government-owned or controlled site...." 10 C.F.R. 30.12. PINS, a by-product material, is the subject of a memorandum of agreement between the Army and DOE to allow its use to determine the content of recovered munitions. The use of the PINS at the Service Response Force (SRF) site is in accordance with the memorandum of agreement and, therefore, meets the requirement for the exemption.

4) The second part of the regulatory test, which requires the performance of work at a "Government-owned or controlled site," needs further analysis. The terms "Government owned or controlled" do not appear to be defined, therefore, rules of reasonable interpretation apply. The PINS is being used at the SRF site inside a house leased by the Army. This meets the "Government owned or controlled" requirement. This conclusion is shared by Mr. Larry Spilker, Chief Counsel of EG&G, (208) 526-1655, who informed me that by-product material is frequently used in Government leased buildings, and meets the regulatory exemption.

c. Resolution: The licensing exemption applies. The PINS may be used and stored at the SRF site in the Army leased building.

SPRING VALLEY EVACUATION  
Recommended Reimbursement Procedures

**SITUATION:** The Corps of Engineers was tasked with establishing procedures and guidelines for reimbursement of reasonable expenses incurred by Spring Valley residents evacuated from their homes during removal operations. Delay in the preparation and publicizing of reimbursement guidelines created a public relations problem and a potential financial burden on residents who do not know in advance what expenditures will be reimbursable.

**DISCUSSION:** Recommendations (Enclosed) were prepared to assist the Corps of Engineers action officers in arriving at appropriate reimbursement guidelines.

MICHAEL K. MILLARD, LTC, JA  
Operation Safe Removal  
Special Staff - Legal  
23 January 1993

SPRING VALLEY EVACUATION  
Recommendations for Reimbursement Procedures

1. Reimbursement Policy.

a. As a matter of policy, the U. S. Army Corps of Engineers should adopt a generous interpretation and application of Mr. Walker's decision for the reimbursement of "reasonable expenses incurred by Spring Valley residents evacuated from their homes during removal activities." Every effort should be made to reimburse for all expenses directly and reasonably resulting from the evacuation to ensure that no affected resident will be forced to suffer an uncompensated loss.

b. Reasonableness and flexibility should be the watchwords in evaluating each request for reimbursement. Evaluators should avoid hard and fast rules and limitations concerning maximum allowable expenses. The facts and circumstances of each case should be carefully considered and independently evaluated. What may appear to be a reasonable application in one situation may not be reasonable in all situations.

2. Persons eligible to request reimbursement.

a. Local area residents should be advised in advance who is eligible to submit a request for reimbursement under this program. The SRF is compiling a list of addresses which are believed to have been in the zone of evacuation during Operation Safe Removal.

b. Because a precise accounting of persons evacuated by officials of the District of Columbia was not established during the first few days of Operation Safe Removal, a procedure should be established for local area residents who do not reside at one of the listed addresses to submit evidence to establish they were in fact evacuated and may be eligible for the reimbursement benefits.

c. Each person residing in an evacuated residence should have an independent right to request reimbursement. However, for ease of adjudication, family units should be encouraged to consolidate their requests for reimbursement.

d. Persons away from their homes during periods of evacuation for reasons independent of the evacuation [for example, persons away on business trips or attending a resident college] should not be eligible for reimbursement for those expenses not directly caused by the evacuation.

e. Procedures should recognize that requests for reimbursement can be submitted by an agent [under a power of attorney], legal representative, spouse, or, for children, parent or guardian of an eligible person.



3. Timeliness of request for reimbursement. Residents should be advised in advance of the deadline for submitting requests for reimbursement. A deadline of at least 30 days from the last day of evacuation may be reasonable; however, requests for exception based on unusual circumstances should be entertained.

4. Form of request for reimbursement. To facilitate submitting a request for reimbursement, a form should be provided to all eligible persons. The request form should have space to set forth:

- a. the name or names of the persons requesting reimbursement.
- b. the address of the evacuated residence.
- c. the dates and times the residence was evacuated.
- d. a narrative description of the basis for the request for reimbursement, including an description of any unusual expenses (other than meals, lodging, and local transportation), and an explanation of why the requestor believes the unusual expenses were caused by the evacuation and are reasonable.
- e. an itemized list of expenses for which reimbursement is requested, including both descriptions and amounts.
- f. the total of all expenses for which reimbursement is requested.

5. Substantiation.

a. Because affected residents were not given in advance established guidelines for submitting requests for reimbursement, adjudicators should be very flexible as to the amount of evidence required to substantiate expenses.

b. If available, for each expense in excess of \$100.00, residents should be asked to provide a copy of a paid bill, receipt, cancelled check, credit card receipt, or similar documentary evidence to confirm the value of the expenditure. If direct documentary evidence of such expenditures are not available, residents should endeavor to provide a statement with sufficient specificity to allow adjudicators to substantiate the validity and reasonableness of the reimbursement requested.

c. Prompt adjudication and payment is essential to maintain the good will of the local residents. For requests for reimbursement in a total amount of less than \$1,000.00, expedited procedures should be established.

6. Advance payment procedures. In order to alleviate personal hardship and financial inconvenience experienced by the evacuated residents, emergency partial payment and advance payment procedures should be developed and immediately implemented.

7. Appeal procedures. Procedures should be developed to allow requests for reconsideration or appeals for any administrative determination of allowable reimbursement expenses which the affected person deems to be insufficient.



MICHAEL K. MILLARD  
LTC, JA  
SRF Legal Advisor

National Defense Area

1. ISSUE: What is a National Defense Area (NDA) and is establishment of a NDA appropriate for Operation Safe Removal?

2. DISCUSSION:

a. A NDA is an area established by a DOD official on non-Federal lands located within the United States, its possessions, or its territories for the purpose of safeguarding classified defense information or protecting DOD equipment or materiel. Establishment of a NDA temporarily places such non-Federal lands under the effective control of DOD and results only from an emergency event. The senior DOD representative at the scene will define the boundary, mark it with a physical barrier and post warning signs, 50 Fed. Reg. 46542.

b. The landowner's consent and cooperation will be obtained whenever possible; however, military necessity will dictate the final decision regarding location, shape and size of the NDA. JCS Pub. 1.

c. Under Army regulation, the On-Scene Commander has the authority to declare a NDA.

d. A NDA has no basis for existing after classified materiel or government property is removed. The size of a NDA is limited to the immediate area where the classified materiel or government property to be protected is located.

e. Establishment of a NDA gives the On-Scene Commander the authority to apprehend or detain civilians who intrude into the NDA.

f. Although establishment of a NDA is often short-lived, it may constitute a takings which could result in compensation to the landowner for the amount of time the NDA is in existence.

3. CONCLUSION: The authority to declare a NDA at the munition removal site is highly questionable. The munitions, having been abandoned during World War I, are not necessarily the property of the U.S. Government. Any classified materiel on or near the site has been brought to the site in response to emergency operations and fall outside the scope of establishing a NDA. In addition, the limits of the NDA must be restricted to the immediate area surrounding the munition pit, and may not extend beyond that discrete area to include the 300 meter safety zone.

WARREN G. FOOTE  
LTC, JA  
AMSTE-JA  
Special Staff (Legal)

24 January 1993

Army as the Lead Agency

1. ISSUE: What is the authority for the Army to function as the lead agency for Operation Safe Removal?

2. DISCUSSION:

a. The National Contingency Plan (NCP) provides for the efficient and coordinated response to releases of hazardous substances into the environment and establishes procedures for undertaking response actions under CERCLA.

b. "Lead agency" means the agency that provides the On-Scene Coordinator/Remedial Project Manager to plan and implement the response action under the NCP.

c. For releases from any DOD facility or vessel, DOD executes lead agency responsibility for the response. 40 C.F.R. 300.120(b) and DA Pam 50-6, para. 2-12c.(1)(b) (1991).

d. DOD will be the removal response authority with respect to incidents involving DOD military weapons and munitions or weapons and munitions under the jurisdiction, custody, or control of DOD, 40 C.F.R. 300.120(c) (National Contingency Plan).

e. The munition removal site was used during World War I by the Research Division of the Chemical Warfare Service (1917-1919) to test and develop chemical warfare materiel. Munitions recovered at the site include Levins projectiles (World War I era mortar round), 75mm artillery projectiles, 3 inch Stokes mortar rounds, 4.7 inch projectiles and grenades. All these items, although abandoned at the site, retain their identity as military weapons. Subsequently, DOD has assumed custody and control of the munitions.

f. BG Friel was designated by HQDA as Service Response Commander/On Scene Coordinator on 7 January 1993.

3. CONCLUSION: There is sound legal authority for the Army to function as the lead agency for Operation Safe Removal.



WARREN G. FOOTE  
LTC, JA  
AMSTE-JA  
Special Staff (Legal)

24 January 1993

## Administrative Record

1. ISSUE: Does 40 C.F.R. 300.800, which requires the lead agency to establish an administrative record to document the selection of a response action, apply to the SRF for Operation Safe Removal?

2. DISCUSSION:

a. 40 C.F.R. 300.800(a) states: "The lead agency shall establish an administrative record that contains the documents that form the basis for the selection of a response action. The lead agency shall compile and maintain the administrative record in accordance with this subpart."

b. 40 C.F.R. 300.800(b) states in part: "...the lead agency shall compile and maintain the administrative record for the selection of a response action...to ensure that the administrative record includes all documents that form the basis for the selection of the response action."

c. Although the requirements set forth above expressly apply to CERCLA response actions, it also applies to the SRF Phase I response. 40 C.F.R. 300.800(e) states: "For those response actions not included in paragraph (d) of this section, the lead agency shall comply with this subpart to the extent practicable." [Underline added].

d. The practical implications of compliance with the above stated portion of the National Contingency Plan includes:

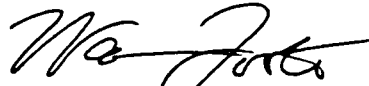
1) Compiling and maintaining an administrative record which includes all documents that form the basis for the selection of the response action.

2) Including in the administrative record the decision documents and those records containing factual information, data and analysis that may form the basis for the selection of a response action.

3) Making the administrative record file available for public inspection.

e. The EPA Coordinator has provided this office with copies of decision memoranda pertaining to CERCLA removal actions which provide guidance as to format and content.

3. CONCLUSION: To the extent practicable, the SRF is required to prepare an administrative record that forms the basis for the selection of a response action pursuant to the National Contingency Plan.



WARREN G. FOOTE  
LTC, JA  
AMSTE-JA  
Special Staff (Legal)

SPRING VALLEY EVACUATION  
Chaplain Services



**SITUATION:** The SRF Staff has inquired about the advisability of using military chaplains to minister and counsel local area residents during Operation Safe Removal.

**DISCUSSION:** An information paper (enclosed) was prepared to inform the SRF Staff of appropriate Chaplain services.

MICHAEL K. MILLARD, LTC, JA  
Operation Safe Removal  
Special Staff - Legal  
26 January 1993

26 January 1993

### Chaplain Services

1. ISSUE: May military chaplains counsel and minister to the needs of civilian residents of Spring Valley, Washington, D.C., in conjunction with Operation Safe Removal?

2. DISCUSSION:

a. Reference, memorandum, HQDA, DAJA-AL, 23 Nov 92, subject: Utilization of Chaplains in Disaster Relief Operations.

b. The Establishment Clause of the U.S. Constitution prohibits government sponsorship of religion.

c. The current Chaplain Corps policy is to avoid even the appearance of an Establishment Clause violation (AR 165-1, para. 2-3a).

d. In reference memorandum, the Office of The Judge Advocate General, after a careful review of applicable Supreme Court and Federal case law, determined that use of military chaplains to minister to the spiritual needs of civilian disaster victims is Constitutionally prohibited. While secular counseling and other secular services for civilian victims was not specifically prohibited by the Constitution, such activities could create the appearance of a violation, would place Chaplains in the untenable situation of having to adhere to strict separation of their spiritual and secular roles, and could result "in litigation and court-mandated restriction on the chaplaincy of an unpredictable scope."

3. CONCLUSION: It is not appropriate for military Chaplains, in their official capacity, to provide spiritual or secular counseling for the civilian residents of Spring Valley. Should a need exist, District of Columbia officials should be asked to provide or arrange for such services for their citizens. Military chaplains may provide secular counseling for SRF emergency response forces, military and civilian, located on site and participating in Operation Safe Removal.



MICHAEL K. MILLARD  
LTC, JA  
SRF Legal Advisor



28 January 1993

## CASH AWARDS FOR DEPT. OF ARMY CIVILIANS

1. ISSUE: May Dept. of Army civilian employees receive reimbursement for extraordinary expenses incurred while on TDY for Operation Safe Removal?

2. DISCUSSION:

a. There is no mechanism to provide direct reimbursement for extraordinary expenses incurred while on TDY. The law and regulations authorizing the reimbursement of traveler's expenses while on TDY is limited to the expense of actual transportation as well as certain specified expenses at the TDY station.

b. The fact that an employee incurs additional personal expenses at their home station because of official travel is not a sufficient basis for shifting the expense to the government. (Excerpt from the Civilian Personnel Law Manual, 2d Edition, 1989, citing a GAO opinion).

c. There is a creative solution for the dilemma posed above. Commanders have discretion to make cash awards to recognize meritorious personal effort, act or service within or outside assigned job responsibilities. The Special Act or Service Award is particularly appropriate to recognize short periods of superior performance accomplished: "(c) At the conclusion of a successful special project assignment." Para. 4-1, Army Reg. 672-20 (1 June 1982).

1) Nominations should be submitted by a supervisor or official with direct knowledge of the act or service within 30 days after the act or service.

2) DA Form 1256 will be used to submit recommendations for this award.

3) DA Form 2442 (Commendation Certificate) may be given with cash.

4) Major commanders may approve cash awards (individual and group) up to and including \$10,000. Approval authority may be delegated to subordinate commands or activities. Para. 4-3, Army Reg. 672-20.

5) Telephonic coordination also reveals that funds should be approved by a work order and fund cite. If the recipient does not work for the awarding commander, the cash award must be approved by the commander's CPO and provided to the recipient's CPO where the check is processed.

3. CONCLUSION: Monetary awards may be given to all Dept. of Army civilians who participated in Operation Safe Removal to recognize their meritorious personal effort at the conclusion of this special assignment. The availability of funding, however, may impose a pragmatic constraint.

A handwritten signature in cursive script, appearing to read "Wa Foote".

WARREN G. FOOTE  
LTC, JA  
AMSTE-JA  
Special Staff (Legal)

# SURGEON

MEDICAL  
After Action Report  
Operation Safe Removal

2 February 1993

## 1. PURPOSE:

### a. Introduction and Background.

- (1) Service Response Force Surgeon.
- (2) Notification. Alerted on 9 January 1993 by Director, Occupational and Environmental Health that he had been tasked to provide a SRF surgeon.
- (3) Time to departure. Approximately 24 hours.
- (4) Protective mask. A protective mask (M17A2) has been issued at the Edgewood Area of Aberdeen Proving Ground.
- (6) Supervisor. The director, special staff, COL Kenison.
- (7) Medical support. Tasked with providing staff support and on-site medical support to SRF.
- (8) Time of arrival. Arrived at Spring Valley at about 1530 for a tour of area.
- (9) Work location. Special staff office in EOC. Also, maintained a sickcall area in TEU operations center.
- (14) Transportation on-site. Utilized the TEU bus to travel to and from the site due to necessity to provide sickcall to this unit twice daily.
- (15) Equipment requirements. Environmentally controlled work area, desk/table, chair, telephone, office supplies and coffee. General support also includes a laser printer and copier.
- (16) Unavailable equipment. Sufficient number of printers. Health care supplies due to operation not being conducted on a military installation.
- (17) Preparation for the mission. Prior identification as the physician designated "on-call" for this type of mission would facilitate being prepared with references, supplies and "POR".

MEDICAL After Action Report  
Operation Safe Removal

(18) Required personnel not present. A medical service corps officer is designated in the CSRFCERP. The administrative assistance would be a valuable asset in a larger operation and definitely if there are casualties.

(19) Deactivation. 2 February 1993

(20) Additional comments.

b. Objectives. The following were the goals and objectives of the SRF surgeon.

(1) Serve as the point of contact for all actions related to health and medical aspects of Operation Safe Removal.

(2) Liaison with the army point of contact at the AOC for the military district of Washington D.C. Required support was requested through this POC.

(2) Establish contact with local EMS to coordinate emergency and routine evacuation.

(3) Establish contact with Walter Reed Army Medical Center Emergency Department to ensure they have been alerted and are prepared to receive chemical casualties.

(4) Advise the Director for Special Staff of the need for additional support to provide for health and medical care for personnel involved in the operation.

(5) Assist local medical providers, as necessary, in management of chemical casualties.

(6) Provide sickcall twice daily and as needed to keep the maximum number of personnel on-site.

(7) Keep ATSDR (CDC) informed of situation.

(8) Keep the Director for Special Staff informed of casualties and sickcall status.

(9) Review the medical support plan initiated by civil authorities.

(10) Establish contact with the senior civilian medical person responsible for medical support prior to arrival of SRF.

MEDICAL After Action Report  
Operation Safe Removal

(11) Determine local civilian medical treatment facility capabilities.

(12) Identify additional medical and decontamination support required to support the maximum credible event.

(13) Assess the current medical situation and advise the Director of Special Staff.

(14) Determine adequacy of TEUs ability to decontaminate chemical casualties.

(15) Keep the Director of the Special Staff appraised of the medical situation and any changes that occur.

(16) Consult with Safety, Environmental, and Operations personnel, as appropriate.

(17) Consult with USAMRIID experts in biological weapons, as appropriate.

(18) Arrange for resupply of medical equipment and expendable items.

(19) Consult with USAEHA concerning worker and civilian exposure to low levels of chemical agents and hydrolysis products.

2. OPERATIONAL SUMMARY:

a. Developed a detailed medical support plan (Appendix I).

b. Distributed a Medical Alert (information paper) as a preventive measure (Appendix II).

c. Produced an information paper on the hazards of known chemical agents (Appendix III).

d. Identified hydrolysis products of the primary agents of concern (Appendix IV).

MEDICAL After Action Report  
Operation Safe Removal

3. OBSERVATIONS AND RECOMMENDATIONS:

a. Lessons Learned and Unresolved Problems.

(1) Medical evacuation support at this site was readily available. The EMS capability to move casualties by ground and air ambulance would probably have been adequate even for the MCE. In addition to Walter Reed Army Medical Center there are numerous large civilian hospitals are located in the NW Washington D.C. area within minutes of the Spring Valley subdivision. Future operations not on or near a military installation will probably not have the evacuation and clinical assets readily available. Both may require that ambulance support and a treatment facility be moved to the site.

(2) Medical resupply of sickcall items was done through the health clinic at Edgewood. A list of supplies was telephonically relayed to that facility and the courier from TEU picked them up on the next trip to Edgewood. This was adequate due to the proximity of the supporting facility. At a more remote site the plan would be more elaborate and tied into the field medical facility indicated in the above paragraph.

(3) EMS personnel doing screening require to be supervised to ensure procedures are not varied. Blood pressure may dramatically increase while donning protective clothing and for a brief time afterward. Vital signs should be taken prior to "dressing out" to cross the hotline.

(4) Food Service:

(a) The caterer supplying food for lunch and dinner to the headquarters building departed the area ninety minutes after setting up the serving line leaving the food in place for personnel arriving late. The sterno canisters were extinguished after about two hours and the food left on the serving line until the next meal (about three hours after lunch and fourteen hours after the dinner meal). Stringent follow-up was required to ensure the food was not consumed late when there was a possibility of developing foodborne illness.

(b) The Red Cross food vendor maintained the food prior to being served in an exemplary manner. The eating area (a GP medium tent) was generally kept clean. Only occasionally was there foodstuff found on the ground inside the tent. This became more frequent toward the end of the operation.

MEDICAL After Action Report  
Operation Safe Removal

(5) Decontamination was provided by TEU and adequate to support the operation. Their workers are well trained and have had considerable experience decontaminating their personnel as they egress across the hotline. Litters were available for transporting casualties through the decontamination process. Their decon line was relatively fixed and appeared to lack the flexibility to be moved should the direction of the wind change at a time when the line was to be used. An alternate line was not observed. A platoon from the 101st Chemical Company was present to assist as needed. The level of training for either of these units in decontaminating a casualty was not assessed.

(6) The personnel assigned to TEU are highly motivated and aggressive in pursuing their mission. However, there were a few civilian personnel that appeared to lack the physical conditioning to excel in strenuous tasks requiring full protective clothing and a respirator. Considering the mission of this unit it could prove disastrous to have personnel unable to respond to an emergent situation due to a lack of physical endurance.

b. Conclusion.

The medical plan and assets on-site were adequate to support Operation Safe Removal. The Washington D.C. EMS personnel performed very well and had the available personnel and vehicles to respond to either the MPE or MCE had that been necessary. The medical facilities were numerous and capable of receiving multiple casualties. Overall, medical support was both available and capable of providing expert health care.

MEDICAL After Action Report  
Operation Safe Removal

4. APPENDICES:

- I            Medical Support Plan
- II           Medical Alert
- III          Information Paper
- IV          Hydrolysis Products
- V           Points of Contact
- VI          Chronology of Work
- VII         References
- VIII        Medical Log

ROBERT M. GUM  
MAJ, MC  
SRF Surgeon



ANNEX M (MEDICAL OPERATIONS) TO SAFE REMOVAL OPERATIONS PLAN

1. ON-SITE MEDICAL SUPPORT

a. SRF Surgeon

(1) The special staff officer responsible for medical support at the site and coordination for evacuation and medical treatment at the nearest appropriate medical facility. Prepare medical assets to accommodate the most probable event.

(2) Responsible for identifying and coordinating additional decontamination and medical support required to support the maximum credible event.

(3) Respond to any required information concerning the medical management of chemical casualties.

(4) The most probable event (MPE) fluctuates with the type of munitions that is uncovered at any given moment. The most probable event would involve the EOD personnel at one of the three areas where they are actively uncovering, packaging, x-raying or otherwise manipulating munitions. The MPE is estimated to involve nine individuals.

(5) The maximum credible event (MCE) could involve civilian inhabitants in the surrounding area. However, the munitions are predominantly mortar rounds and live projectiles with a short effective bursting radius. Chemical munitions could pose a threat for workers in the immediate area, however, the vapor plume traveling downwind would dissipate with distance. Cool damp conditions will significantly reduce the hazard of chemical agents.

b. Fire Department Surgeon

(1) Dr. Robert Bass is the director of the EMS Bureau of the Washington D. C. Fire Department. He was primarily responsible for coordination and arranging for medical support on-site prior to the activation of the Service Response Force.

(2) He can be reached by beeper at telephone number 539-5152.

c. EMS Personnel

(1) A total of four personnel are available to provide evacuation and treatment.

(2) One supervisor (EMS control) is located on-site.

d. Accident Response

(1) EMS

(a) One ambulance will be positioned on-site at 52d Court and the EMS personnel will conduct screening of personnel prior to beginning of each shift.

(b) One ambulance will be positioned on-site on Warren Street on stand-by.

(2) A total of 21 to 26 EMS ambulance units are available from the Washington D.C. EMS system.

e. Sick-call procedures

(1) Limited sick-call will be available on-site.

(a) Military sickcall will be conducted at 0730 and when TEU outbriefs at the TEU command post.

(b) The SRF surgeon will see personnel in the special staff area as needed throughout the day.

(c) In case of an emergency during non-duty hours the SRF surgeon is located in room 611 at the Embassy Suites phone number 362-9300.

(2) Medical needs requiring further treatment will be referred to local medical facilities.

2. SPECIAL RESPONSE

a. Decontamination

(1) EOD will provide decontamination of personnel and casualties as needed per their SOP.

(2) Decontamination of a casualty(s) at the supporting medical facility may be limited to a thorough wash with soap and water if a 0.5% hypochlorite solution is not available.

b. Treatment of chemical casualties

(1) Treatment of chemical casualties will be conducted IAW with FM 8-285.

(2) The SRF surgeon will coordinate special treatment requirements with the fire department physician and supporting medical facilities.

### 3. MEDICAL EVACUATION PLAN

#### a. On-Site ambulances

(1) The ambulance located in a protected area near the hot line will be the first ambulance to respond to an injury.

(2) The second ambulance will respond only if called for by the EMS controller or authorized person.

b. The requirement for additional ambulance support will be determined by the senior medical officer present and requested through the EMS controller.

c. Air Evacuation is available by the U.S. Park Police through the EMS communication control system.

### 4. SUPPORTING MEDICAL FACILITIES

a. The primary medical facility for military personnel is Walter Reed Army Medical Center.

#### b. Civilian Personnel:

(1) The designated trauma center is Georgetown University Hospital. In addition this facility is the eye trauma center.

(2) George Washington Hospital has hyperbaric capability and designated to receive chemical casualties.

(3) Additional hospitals that have been coordinated with to provide support include:

Sibley Hospital for minor trauma.

Washington Hospital Center for burns.

National Childrens' Medical Center for pediatric treatment.

(4) Coordination with civilian medical facilities has been done by Dr. Bass.

### 5. MEDICAL AUGMENTATION

a. Decontamination augmentation will be provided by Walter Reed Army Medical Center.

b. The Medical Chemical Advisory Team from USAMRICD is on-call for technical and medical consultation. A team is available for deployment to the site if required.

6. MEDICAL SUPPORT 16 - 20 JANUARY 1993

a. Concept of Operations.

(1) Recovery operations will cease at the close of business 15 January 1993. Activities on 16 January will be limited to equipment maintenance and general cleaning of the area of operations.

(2) About 20 military personnel will be on-site to support the security mission. These personnel will work with the D.C. police.

b. Emergency Medical Support.

(1) The EMS system can be accessed through either a police radio or by dialing 911 on a commercial telephone. Their response time from the nearest fire station is less than five minutes.

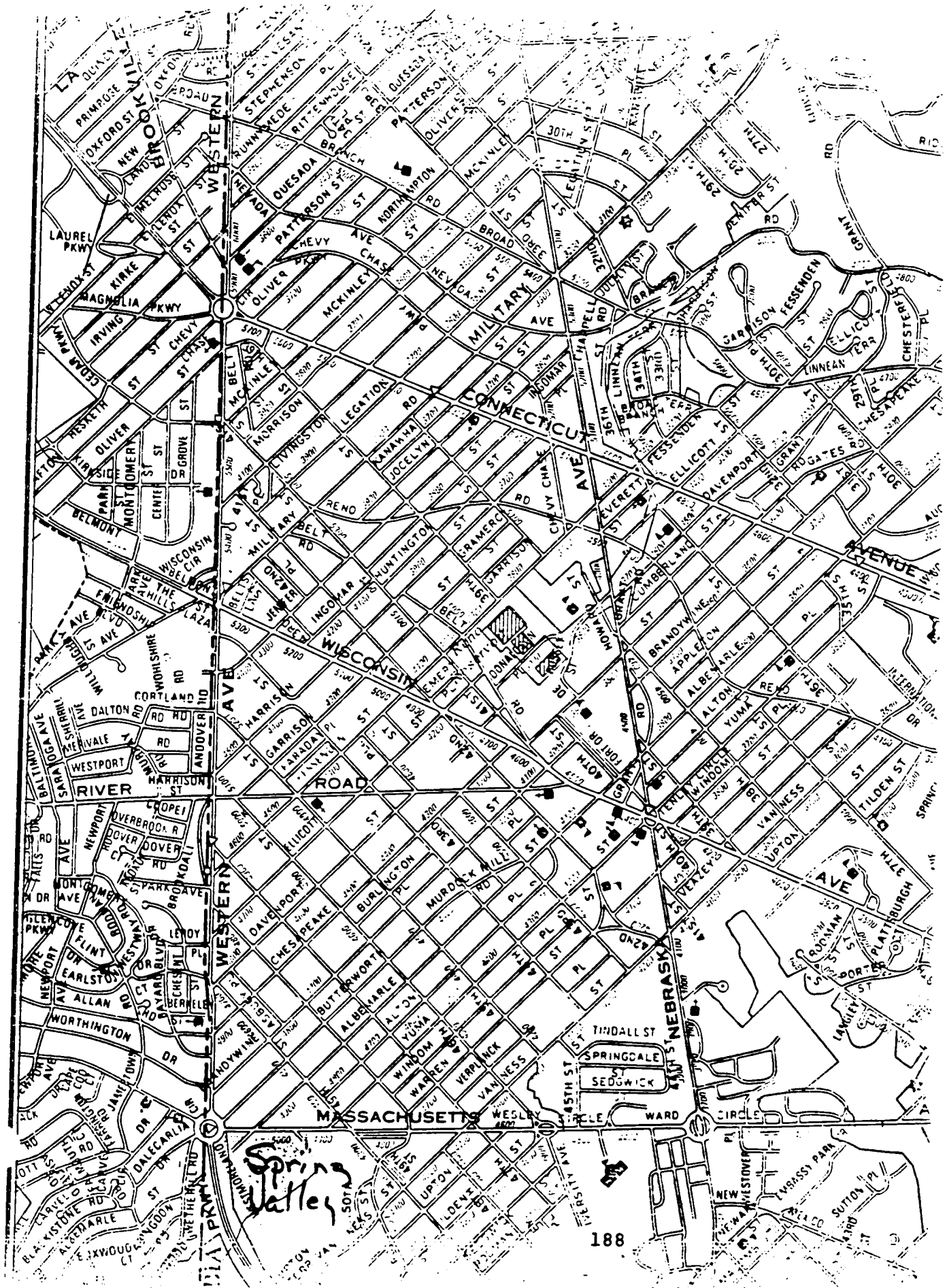
(2) Military personnel will be transported to Walter Reed Army Medical Center. The EMS personnel may elect to utilize another facility if the situation requires immediate care.

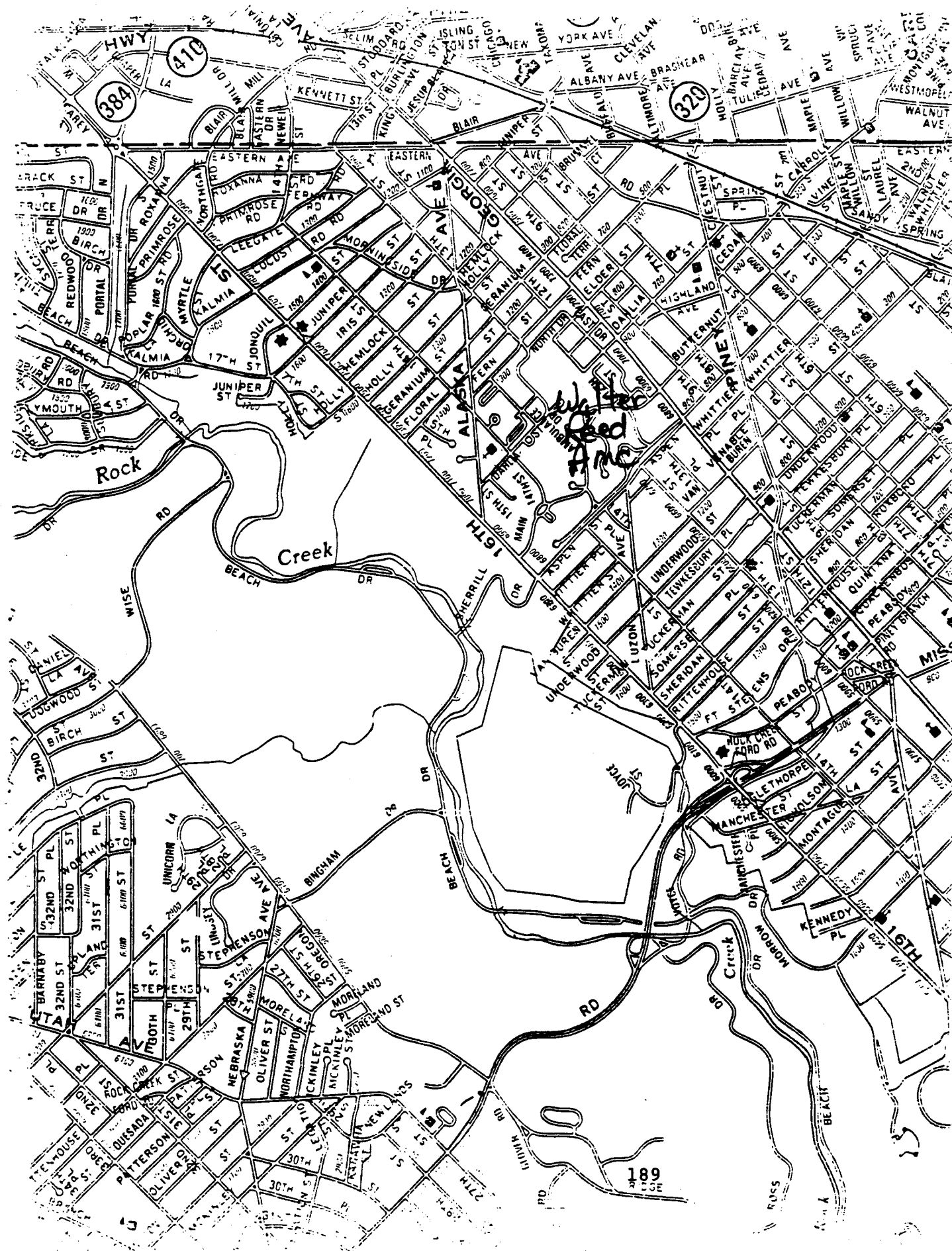
c. Routine Medical Care.

(1) Non-urgent medical care will also be at Walter Reed Army Medical Center emergency department.

(2) A map of this area to include Walter Reed Army Medical Center is attached.

1. SOUTHEAST COMMUNITY  
574-6541-46-47  
574-6545 (TELEMETRY)
2. CHILDRENS  
745-5433
3. COLUMBIA  
293-4444
4. MED-STAR  
877-7234-7235
5. HOWARD UNIVERSITY  
865-1131-32-41-42
6. D.C. GENERAL  
675-7518 OR 7101  
675-7020 (CHG. NURSE)
7. GEORGETOWN UNIVERSITY  
784-2118 (ER)  
784-3800 (SECURITY)
8. GEORGE WASHINGTON UNIVERSITY  
994-3884
9. HADLEY  
574-5750-51
10. PROVIDENCE  
269-7001 (ER)  
269-7093 (DESK)
12. SIBLEY  
537-4080 (ER)
13. WASHINGTON HOSPITAL CENTER  
877-5515 (ER)  
877-6512
14. WALTER REED  
576-1199
15. VETERANS  
745-8000  
EXT. 8357  
8358  
8359
16. P.G. GENERAL HOSPITAL  
(301) ~~341-2030~~  
618-3750
16. WASHINGTON ADVENTIST  
HOSPITAL  
891-5070 (ER)  
891-5040 (OB)
- MONTGOMERY COUNTY FIRE  
(301) 217-4644
- PRINCE GEORGES FIRE  
(301) 499-8400
- BETHESDA CHEVY CHASE RESCUE  
SQUAD  
(301) 657-0077
- POISON CONTROL  
625-3333





## MEDICAL ALERT

1. Some of the personnel involved in Operation Safe Removal are in their ninth work day. At this point certain health issues have become apparent. Small group leaders are in an opportune position to identify personnel that are at risk for unnecessary injury or illness. The following are health issues that both the individual and the unit leaders need to bear in mind.

a. **WATER INTAKE.** Thirst is a poor indicator of an individual's need for water, particularly in a cool damp environment. A dehydrated individual will experience headache and dizziness, and a decreased ability to make appropriate decisions, increasing the possibility of an accident. The unit commanders/leaders must ensure that all personnel have ready access to potable water (coffee adds to dehydration). The appropriate quantity of water can be judged by the color of the urine. Normal urine is light yellow to clear. Dark yellow urine is an indicator of dehydration.

b. **FOOT CARE.** Many individuals have been wearing rubber boots due to the wet weather. This promotes the development of immersion foot. Should it be necessary to continue to wear rubber boots changing socks frequently and using foot powder is recommended. Other types of cold injury can be avoided by frequent warming and bringing problems to the attention of supervisors.

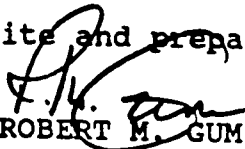
c. **EXTENDED WORKING HOURS.** Working long hours for several consecutive days without a break will become evident in an individual's behavior and ability to function effectively. A change in an individual's attitude may indicate that person requires rotation from a critical position to one with more latitude or less stress.

d. **MEDICATIONS.** Personnel taking medications routinely should ensure that they have sufficient quantities available to last through the operation.

e. **NAILS.** There are nails lying throughout the area. A few have found their way to into chair seats and other unlikely places. These should be disposed of appropriately.

2. Military sickcall is at 0730 and when TEU outbriefs at the COB each day in the TEU Cmd Post. In case of an emergency during non-duty hours the SRF surgeon is located in room 425 at the Embassy Suites phone number 362-9300.

3. Civilian EMS personnel are on-site and prepared to respond to emergencies.

  
ROBERT M. GUM  
MAJ, MC  
SRF Surgeon



INFORMATION PAPER  
CHEMICAL AGENTS IDENTIFIED IN THE SPRING VALLEY AREA

The purpose of this information paper is to address medical issues concerning the acute effects of the chemical agents identified in the Spring Valley residential area. The chemical agents discovered at this site were apparently deposited there during the World War I time frame. The mention of chemical warfare agents commonly instills immediate fear of an insidious threat. However, a better understanding of the agents present in Spring Valley will serve to alleviate some anxiety the homeowners in the area must surely be feeling.

Chemical agents are typically packaged in shells or canisters. The munitions identified in the Spring Valley area have been levins canisters, mortars and small hand held devices. This fact limits the amount of chemical agent present and the area that could be affected should one of the shells not be intact. Working with small chemical munitions makes the task safer for the military personnel and reduces the risk for residents.

Chemical munitions were designed and produced with several objectives in mind. Typically, the term chemical warfare agents invokes visions of massive numbers of casualties with little hope of survival. This is not true of several of these chemicals. These were developed with the intent of producing casualties that would become ill or injured to the point that they require transportation to a medical treatment facility. This would cause not only a reduction in the fighting strength but require important support personnel to assist the casualties. At least two of the agents identified at the Spring Valley area are of this type. Adamsite is termed a vomiting agent because when inhaled or ingested in sufficient amounts it results in the individual becoming ill and incapable of performing routine tasks. Lesser exposures cause irritation to the eyes with tearing, sneezing and coughing. Recovery from exposure to adamsite is spontaneous and requires only supportive care. Lewisite is a second agent that is typically not lethal as a vapor. The action of this agent is to cause pain and blisters that would render a soldier ineffective. Exposure to lewisite causes immediate burning of the eyes and skin, throat irritation, and complicating respiratory illness in large doses. If lewisite is ingested diarrhea, nausea and vomiting may result. Personnel exposed to lewisite will require medical attention but only those exposed to large amounts of the agent will be in any danger.

Phosgene is an agent that does not fit the above category. Exposure to a sufficient amount of this agent can cause severe respiratory illness. The more serious effects are preceded by coughing and choking and should alert the individual that he or she needs to seek medical attention. Fortunately, phosgene is nonpersistent and dissipates very rapidly. The quantity of agent

present in the munitions found in this area would be a hazard only for those in the immediate area for a brief period.

White phosphorus is not a chemical warfare agent but classified as an incendiary agent it burns readily giving off a white smoke and is used as a marker for various purposes. Skin contact with this compound results in immediate burning. This will continue so long as the white phosphorus is in contact with oxygen. Medical treatment will be required to remove the white phosphorus and treat the burn injury.

The cool damp weather has been an important factor in the safe removal of these agents. The chemical properties of these compounds make them less volatile under these conditions and therefore less hazardous.

ROBERT M. GUM, D.O., M.P.H.  
Major, Medical Corps  
Service Response Force Surgeon

Hydrolysis products of suspected agents in the Spring Valley Residential area.

Lewisite	HCl Chlorovinylarsenous oxide (a mildly toxic & blistering compound)
Phosgene	HCl CO <sub>2</sub>
Mustard	HCl Thiodiglycol
Adamsite	HCl Diphenylarsenious acid

Above information taken from: Compton, J.A.F., Military Chemical and Biological Agents, September 1987

OPERATION SAFE REMOVAL  
Medical Contacts - Off Site

MAJ Robert M. Gum, MC  
Service Response Force Surgeon  
Program Manager, Occupational and Environmental Medicine  
U.S. Army Environmental Hygiene Agency  
Aberdeen Proving Ground, MD 21010  
(410) 671-2714

Pentagon Army Operations Center  
MAJ Gunn  
(703) 756-8187/96

COL Gary Hurst, MC  
Commander  
U.S. Army Medical Research Institute of Chemical Defense  
Aberdeen Proving Ground, MD 21010  
(410) 671-3276

LTC Holly Doyne, MC  
Occupational Medicine Consultant  
Office of The Surgeon General  
Falls Church, VA  
756-0125/0133

LTC David Wilder  
Chief, Occupational and Environmental Medicine  
U.S. Army Environmental Hygiene Agency  
Aberdeen Proving Ground, MD 21010  
(410) 671-2714

COL Zeligs  
Emergency Department  
Walter Reed Army Medical Center

Chief Supervisor EMS  
673-3360/3362

Edgewood Area Health Clinic  
Aberdeen Proving Ground, MD  
(410) 671-3726

Mr Rabb  
Center for Disease Control  
(404) 488-7100

LTC Samiljan  
Forest Glenn Section  
Walter Reed Army Medical Center  
(301) 427-5161

Dr. Robert Bass, MD  
EMS Supervisor  
Washington, D.C.  
beeper - 539-5152

## Chronology of Medical Improvements with Operation Safe Removal

The following is a chronology of the continual medical improvements that have been made during operation Safe Removal

11 Jan    -- Developed a Draft Medical Operations Plan.  
Following an evaluation of the number of personnel, most probable event and medical assets on-site a draft medical operations plan was produced.

          -- Observed EMS Personnel Screening TEU. The D.C. Fire Department EMS personnel had started a screening program that included blood pressure, heart rate, respiratory rate and ECG monitoring. The ECG monitoring was discontinued.

          -- Established Initial Contact with Medical Operations at AOC. After several phone calls the medical point of contact for Operation Safe Removal was identified and initial requests for medical support were made.

          -- Adjustment of Medical Supplies for EMS. Medical vehicles were equipped for trauma. There was a need to adjust supplies to support a chemical casualty.

12 Jan    -- Information Paper. Prepared an information paper on anticipated chemical agents of era.

          -- AEHA Support. Established contact with AEHA Waste Disposal Engineering Division and Toxicology to determine acceptable soil levels of chemical agents.

13 Jan    -- Information Paper. Reviewed and corrected information on chemical agents for PAO.

          -- ATSDR. Contacted ATSDR at Mr. Bacon's direction and was referred to CDC Emergency Preparedness Office. Spoke to their POC and briefed him on Operation Safe Removal.

          -- Medical Resupply. Arranged for TEU courier to stop at the Edgewood Health Clinic to pick-up supplies periodically as required.

14 Jan    -- Medical Alert. Wrote a medical alert addressing a preventive strategy for avoiding health problems.

15 Jan --Hydrolysis Products. Determined the hydrolysis products for the agents of concern.

16 Jan --Storage of PINS Device. Arranged to store the radiological source for PINS device at Forest Glenn section of Walter Reed Army Medical Center.

MEDICAL REFERENCES  
Service Response Force

Army Regulations

AR 40-13            Medical Support - Nuclear/Chemical Accident/  
                         Incident, 1 Feb 1985

AR 50-6            Chemical Surety Program, 12 Nov 1986

AR 385-40          Accident Reporting and Records, 1 Oct 1988

DA PAM

DA PAM 50-6        Service Response Force

Field Manuals

AM 3-9            Military Chemistry and Chemical Compounds

FM 3-21            Chemical Accident Contamination Control

FM 8-285          Treatment of Chemical Agent Casualties and  
                         Conventional Military Chemical Injuries, Feb 1990

HSC Regulations

HSC Reg 40-14     Medical Support - Nuclear and Chemical Personnel  
                         Reliability Programs

HSC Reg 40-14     Medical Support - Nuclear and Chemical Personnel  
                         Reliability Programs, 4 Oct 1984

HSC Suppl 1        Chemical Surety, 10 Feb 1988  
to AR 50-6

USAEHA Technical Guides

USAEHA TG 124    Occupational Health Program Manual, March 1982

AMC Regulations

AMC Reg 385-131    Safety Regulation for Chemical Agents H, HD, HT,  
                         GB, and VX

AMC CSRFCERP      Chemical Service Response Force Commander's  
                         Emergency Response Plan



Oak Ridge National Laboratory

ORNL-6628      Reentry Planning: The Technical Basis for Offsite  
Recovery Following Warfare Agent Contamination,  
April 1990

Testbooks

Compton, J.A.F.; Military Chemical and Biological Agents, The  
Telford Press, 1987

OPERATION SAFE REMOVAL  
SRF SURGEON LOG

9 January 1993

- 1200        Notified by LTC Deeter that I was designated as SRF Surgeon for above operation in the Spring Valley area in NW D.C.
- 1510        Met with COL Kenison who briefly described the situation

10 January 1993

- 1230        Met again with COL Kenison and briefed in more detail
- 1300        Departed for D.C. in POV
- 1600        Traveled to site with group by bus to observe site
- 1810        Established that Dr. Robert Bass is the physician for the EMS system in this area. He will be available in a.m.

11 January 1993

- 0747        Special Staff Meeting:
1. 0900 site visit
  2. key meetings
    - 1800 - BGs meeting with homeowners
    - 2000 - Staff meeting (BG)
    - 0800 - Sp Staff meeting (COL K)
    - 1700 - Sp Staff meeting (COL K)
  3. An action journal will be kept by Stacey Miller. Be sure that all incoming or outgoing taskers get a #.
  4. Keep a journal to submit Fri
  5. Telephone # to call into the EOC is 282-0634
  6. Local residents live in surrounding hotels
  7. Operation Safe Removal is current name for the operation.
  8. Movement of the various types of rounds described
  9. Timelines for the week described
  10. Group taskers passed out
  11. Individual taskers passed
    - Medical - Medical plan by 1200, written by COB

11 January 1993 (cont.)

0850 Observed EOD personnel dressing out and medical screening by EMS personnel. Screening consists of cursory medical history, BP, HR, RR and rhythm. The rhythm was discontinued. EOD is wearing VonBlucher protective undergarments. LTC Batt will provide me a copy of the CDPRP roster.

0900 Telephone contact established with Dr. Bass. His beeper # is 539-5152

1007 Pig #1 was positive for lewisite

1130 Medical annex to oplan (1st draft) reviewed by Mr. Zervas (EMS coordinator) without significant changes recommended

1214 Called MAJ Madsen to give him an update

1300 Prepared a medical situation map

1350 Received a msg that LTC Coleman from the AOC wants to discuss BG Friel's desire for back-up medical support (693-4827/4826)

1401 LTC Coleman referred me to MAJ Gunn at OTSG (703-756-8197/85)

1440 Reached MAJ Gunn after several attempts. WRAMC and MRICD will be tasked to be on-call

1545 BG Friel wants an information paper on symptoms and diagnosis of L, DM, CG

1600 Info paper submitted. COL Read said the BG needs bullets prepared to glance at during a press conference

1615 Bullets submitted

1700 Called to site to evaluate 1SG who identified a drop amount of unknown liquid coming out of the nose of a round. The drop readily evaporated. The 1SG was wearing a mask at the time and the personnel behind him, in open air unmasked, did not notice odor or sensation. They were not complaining of anything and their vital signs were normal. My assessment was that an exposure did not occur.

1800 Recommended that EMS personnel acquire vaseline gauze to treat WP.

12 January 1993

0800      Toured site area and took pictures

0850      Reviewed med annex to oplan

0915      Returned Pitt Tomlinson's call

1115      Special staff transportation meeting

1200      Tasked by COL Kenison to prepare an info paper on the health effects of L, DM, CG

1232      Called COL Hurst and requested support in the above task

1355      OSHA soil levels

L	4.2	mg/g
HD	0.06	mg/g
DM	10.4	mg/g
AC	6.3	mg/g
CG	8.3	mg/g
CK	12.5	mg/g
As	4.2	mg/g
Chloropicrin	14.0	mg/g

1630      Received FAXs from Dr. Hackley

1645      Special staff discussion of equipment on-site (dirty side of hotline). From health standpoint a thorough washing would suffice to release equipment.

13 January 1993

0745      On-site

0800      Special staff meeting  
         Mrs Bryson and Mr Davis are heads of homeowners group  
         get after action report started  
         LESSONS LEARNED  
         SITUATION:  
         LESSON:

Review operations plan for COL Kenison

Info paper to PAO

13 January 1993 (cont.)

- 0900 COL Kenison's Op Plan typed  
Info paper submitted to PAO with changes  
Called LTC Wilder to confirm arsenic is a confirmed  
human carcinogen and not on a suspected list
- Read through info from Dr Hackley last night. Will  
call him for additional sources ASAP
- 0936 Called Dr Hackley and he will have information on low  
levels of DM, L, CG pertaining to health effects  
summarized and FAXd to me
- 1005 Coordinate with decon platoon from 101st chem co.
- 1027 Arsenic is a known human carcinogen
- 1110 Discussed the need for an ambulance to standby at  
Andrews AFB. COL Kenison agrees that their support is  
sufficient - make no special medical requests
- 1130 Received a copy of CDPRP from SFC Robinson, TEU
- 1215 Spoke with Dr Kamperman at EA Clinic. He will put  
together a sickcall push package and TEU will pick it  
up this p.m. (clinic # 671-3726)
- 1230 EMS coordinator reported that 15 personnel came from  
the pit are and reported they were sick
- 1240 NCO and safety individual stated that 15 or so  
personnel changed shift and needed to be screened.  
Only one (1) was not feeling well. I will change buses  
so I can ride in and out with TEU to conduct a formal  
sickcall with this unit twice daily
- 1438 Called AEHA to discuss exposure numbers taken from  
construction criteria and applied to a residential  
scenario  
The new # for Lewisite is 30 mcg/m/day --> 0.0625 mg/g  
of soil
- 1545 Mr Bacon wants me to contact ATSDR and insure they are  
informed of the operation at Spring Valley
- 1547 ATSDR (404) 639-6070 or 330-9543 referred to a Mr  
Maurice West at (404) 639-6070 as my POC

13 January 1993 (cont.)

- 1623 At about 1500 I evaluated an individual that had lacerated his head carrying a projectile. EMS personnel treated the wound. My concern was for his status prior to his injury (i.e. did his health status lead to the injury)
- 1703 Mr Rabb (404) 488-7100 is POC at CDC for ATSDR and is available for information and if an offsite incident occurs they will be interested. Need to call them Fri for an update
- 1728 Get copy of PELs
- 1808 Need chapstick for personnel

14 January 1993

- 0700 Departed hotel with TEU
- 0730 Conducted sickcall for TEU. 1 SSG sent to Edgewood Clinic by courier to be further evaluated for sore throat and chest congestion (Rule out pneumonia). A second soldier returned to rear by LTC Batt
- 0945 Ed Eitzen needs document
- 1100 MAJ Mott from transportation section arranged with MAJ Gunn, AOC, for Redstone and Pinebluff to provide emergency response. COL Kenison will call LTC Coleman to arrange for a response along route of aircraft
- 1131 LTC Doyne, OTSG, unable to answer phone
- 1135 Notified Edgewood TMC that courier will pick-up some chapstick today
- 1210 Received call from MAJ Gunn. It will be necessary for aircraft carrying munition to notify airfield and airfield will notify medical authorities that they have responsibility to respond to an emergency
- 1355 Gave a copy of medical alert to LTC Batt and six copies to SGM for distribution to NCOs. Will give another to COL Read
- 1800 Town meeting - need to arrange medical support for guard force that is to stay behind for 5 days (weekend and inauguration)

14 January 1993 (cont.)

1850 COL Kenison agreed to present the medical alerts to the commanders 1900 meeting

15 January 1993

---- Conducted sickcall for TEU: for sore throat

0800 Called TMC to request additional supplies and spoke to new NCOIC. He suggested we get medical support nearby. OIC will call me at Ops Ctr. Medical resupply requested:

Robitussin DM  
Chlorphenarimine  
Moleskin  
Throat lozenges  
Chapstick  
Thermometers

0835 30-40 active duty personnel will be on-site over the 5 day break. Need to arrange health care support and get the information to them. Also, need to get water into the EOC.

0846 Spoke to clinic OIC and he will provide support as needed

0924 Called ICD to ask LTC Dolzine about health hazards of thiodiglycol. He is out today. Dr. Jacobowski will call with information.

1005 Called COL O'Donnell about POC for medical support over next 5 days. Referred to COL Zeligs 576-1199/3927.

1200 Thiodiglycol LD<sub>50</sub> 3000 - 6000 mg/kg. Adverse health effects include headache, nausea and vomiting

1303 Thiodiglycol CAS 111-48-8

1305 Talked to Colleen about LD<sub>50</sub> for thiodiglycol and she agreed with the above numbers. Phone number for AEHA toxicology is 671-3627

15 January 1993 (cont.)

1440      Hydrolysis products:

L	-	Hcl Chlorovinylarsenous oxide (a mildly toxic and blistering compound)
CG	-	Hcl CO <sub>2</sub>
HD	-	Hcl Thiodiglycol
DM	-	Hcl Diphenylarsenious acid

1525      Received medical supplies from Edgewood

1545      Spoke with Mr. Weeks and LTC Broadwater about  
information requested on hydrolysis products - John  
Resta is to send FAX today

1935      Need to call at 0800 if we need an ambulance for  
helicopter landing. POC is chief supervisor  
673-3360/2.

1700      Late entry: General toxicological information is bout  
to be faxed but as expected it is not as specific as  
data on agents.

2100      FAX not received from AEHA

SICKCALL SUMMARY FOR WEEK ONE: An average of six  
individuals were seen on a daily basis (total of 24) with only  
one NCO being returned to APG for a more complete evaluation to  
rule out pneumonia (he was transported by TEU scheduled courier).  
The primary complaints were: URI and sore throat. A few  
individuals complained of headache.

16 January 1993

0755      Called EMS and requested an ambulance be dispatched to  
site for today.

0845      Ambulance onsite



0900 Observed , on request, for a rash.  
 S: States itching stated on head and neck and rash developed about 12 hours ago. Denies difficult breathing or additional symptoms. Taking amoxicillin and entex for an ear infection. Stopped both meds last night. Also, states she worked with fiberglass insulation yesterday, but, has done that previously without a problem.  
 O: No apparent distress other than itching. Redness and swelling of volar surfaces of wrists (left > right). Further exam deferred.  
 A: Allergic dermatitis probably secondary to amoxicillin  
 P: See private physician this a.m.. Prefer she travel with a friend

0924 Soldiers to be seen at TEU Ops Ctr

0930 101st Chem Co seen for sore throat  
 101st Chem Co eval for asthma attack last p.m. - referred to WRAMC for eval and prescription

1051 Gave med plan for weekend medical support to Ken Boyd to pass/announce during security inbrief

1300 Passed weekend med plan to CPT Ross, OIC of security force

1340 Released

1500 Arrived Jarrettsville. Odometer reading: 142340

#### 20 January 1993

1100 Met COL Kenison at cleaners on EA. No knowledge of a meeting at this time

1250 Notified that orders are ready. See Gwen Liedig in room 167, bldg 1

#### 21 January 1993

0500 Departed Jarrettsville for Spring Valley

0700 Arrive Spring Valley

0715 At TEU Op Ctr for sickcall

0800 At EOC to set-up area

0820 MAJ Motz needs an area to store 2 PINS that have a radiological hazard. He wants to know if WRAMC might have that capatility

0855 Unable to reach MAJ Gunn

1030 Talked to two contractor personnel for Phase II and advised them of current medical support. Suggested they rely on EMS for evac. Also, gave them a list of available medical facilities, directions to USUHS, and copied portions of map identifying hospitals

1100 Talked to MAJ Gunn. Requested he notify WRAMC that we are operational at present. Also, see if we can store the PINS overnight in nuclear medicine.

1140 At about 1000 I requested Dave Mukai research health effects of Californium 252

1200 LTC from WRAMC called to discuss radiation storage

1250 LTC Camiljan, Forest Glenn (301-427-5161) is POC at WRAMC for storing PINS after hours. He will arrange for storage over weekend and at night. Gunn did ask if there is any DOE facility nearby

1325 MAJ Mott says the arrangements for the PINS has been completed at WRAMC

1335 LT Hart from AEHA will FAX info on Californium 252 today

1630 Evaluated soldier from TEU for dust in eyes. RTD after eye wash by EMS

1810 Went to TEU Ops for sickcall but they had already closed the site

1910 Three personnel seen for sickcall today

1930 Staff meeting 89 rds as of today

2130 Evaluated for small laceratin to forehead in his room - minor laceration without sequelae

22 January 1993

0645 Bussed to area

0700 Safety briefing and sickcall  
1 soldier with bursted blood vessel in left eye -

RTD

1 soldier for reevaluation of dust in eyes - RTD

0800 4 star visit

0805 Special Staff meeting: medical objectives for today  
Call ATSDR  
Arrange lab at WRAMC  
Cancel ACLS

Hotline # to EOC 282-2773

0810 Talked to Mr Blades about arsenic levels identified.  
They have been very low (well within PEL)

0920 transported to WRAMC with differential dx:  
1. Viral Syndrome  
2. R/O Mononucleosis  
3. R/O Meningitis

1000 Called WRAMC ER to alert physician of  
pending arrival

1215 Treated for superficial laceratin of left  
index finger. No evidence of agent exposure.

1615 Spoke with Dr. Folmin about . He is waiting  
for results of spinal tap.

1755 ER doc has ruled out all suspicions

1845 Talked to Les Caudill about and he agrees  
that it doesn't sound like a bio agent exposure

1900 Expressed my concern about TEU wearing only dust masks  
instead of respirators while they dig. Safety is  
working this issue.

2030 Evaluated in his room, he appears well with  
some residual headache

23 January 1993

0640      Ate breakfast with                      . Will have him remain in room today and call to check on him.

0715      Sickcall: one person for throat lozenges

1015      Called                      He was sleeping and feels a bit better now

1030      Talked to Mr Lewis, EMS coordinator, to request a minimum of one medic unit and one basic unit be physically located on this site and that I am to be notified of any changes in medical support prior to changes being implemented in the future

1145      Dr Bass came with some concern about having a second unit on-site. There are a number of demonstrations going on in town and he may need to pull the basic unit.

1210      Basic unit is on-site

1400      Evaluated a Dugway soldier for headache and indigestion. He will stay on clean side of hotline today

1415      Briefed LTC Batt and CPT Brasseur on possibility of common source for cause of two personnel with headache. Doubt a chemical agent, but, will research and get back to them.

1605      Called                      again. Decreased headache. Will check on him this evening.

1700      Special Staff Meeting

1730      Sickcall in TEU Ops Ctr - need to enforce water intake

1900      Saw                      in his room. Doing better with stable vital signs

24 January 1993

0700 Sickcall onsite - noone

0730 In EOC

0745 Called by EMS to evaluate a soldier with an irregular pulse

0750 Assessed with irregular supraventricular rhythm evident on ECG strip. Referred to WRAMC for evaluation

0815 Reviewed screening record for personnel going down-range. Large number of personnel with hypertension and increased pulse rate.

0830 Briefed LTC Batt on above findings.

0835 Requested a list of all personnel that works for TEU by place of work by this afternoon

0900 Briefed BG Friel and COL Kenison on concerns about number of personnel with increased blood pressure and pulse

0905 Will develop a method of tracking BP. Will also be on-site to observe procedures of EMS personnel in screening and double check vital signs as needed.

0915 Briefed George (safety) on BP problem and my continued concern for personnel working in most hazardous areas without respiratory protection more than a dust mask

1000 Called ER doc and requested he get an arsenic level on Turn around time is 1-2 weeks.

1020 Called by SFC Robinson concerning an individual soldier with chest pain

1025 observed in changing tent in no apparent distress. Evaluation indicates musculoskeletal pain. Will monitor q15min in ambulance before making a determination on status.

1200 Released to duty with the diagnosis of musculoskeletal pain

1430 Unable to identify specific cause for the number of hypertensive personnel. Suspect anxiety and long hours could be playing the dominant role

24 January 1993 (cont.)

1600 Talked to ER doc at WRAMC who suggested tension may be responsible for increased BPs. He is ER doc with strong toxicology background

1715 Looked at BPs recorded by EMS personnel. is 192/118. Evacuated him to WRAMC by government vehicle.

1745 Called ER and alerted physician about . Was just told that has had one or more heart attacks.

25 January 1993

0650 Bussed to area - present for duty. ER doc  
deferred evaluationlast night

0700 Observed EMS personnel doing vital sign checks. Had  
TEU personnel relax a few minutes before or after  
donning coveralls, etc. Also, sent one EMS team to  
warm-up tents down the hill with same instructions.

0800 Cursory evaluation of BPs indicates they are more  
normal today.

1000 Called hospital for . His mother is critical  
and on a ventilator. Hosp POC is RN Rachs (606) 275-  
6630

1040 COL Kenison tasked me to have a psychiatrist and  
chaplain onsite to support residents from 1200 to 1600  
daily.

1055 Spoke with Jim Wittcomb at AOC. He asked if we needed  
a psychiatrist or psychologist? Also, wants to know  
where the request is coming from. [Good questions I  
should have asked - stop the knee jerk response to  
taskers!!!]

1110 Several BPs in EOC are within normal limits

1220 COL Kenison OKd a psychologist and Mr. Boyd is pursuing  
a chaplain

1330 Called AOC and requested a psychologist

1530 Talked to LTC Millard about legal aspect of having a  
military psychologist and chaplain. Neither are  
authorized to support civilain support.

25 January 1993

- 1650       Talked to AOC and put request for psychologist on hold until I get confirmation thru COL Kenison that BG has dropped request. At present only 5 people spend the entire day and the city has one supervisor, a crises intervener (in the afternoon) and a minister that will start coming by this week
- 1700       Described the city's commitment of social resources and recommended that we drop the Army request for the same. He concurred
- 1705       Cancelled above request for army social types.

26 January 1993

- 0700       Bussed to area
- 0715       BP checks and sickcall.                               BP 150/110.  
Recommended he be returned to EA for follow-up on uncontrolled hypertension.
- 1004       Lt Roberts DCPD requested a letter stating background readings and health status of personnel in area on 12 Jan
- 1200       Prepared letter and checked numbers and times with TEU (CPT Brasseur) Talked to George and Sheldon about air monitoring. They were doing breathing zone monitoring for HD.
- 1430       Talked to MAJ Thompson and requested he see that the food line in the basement be closed 30 minutes after the caterer leaves to avoid personnel eating the food when it can be contaminated and produce food poisoning
- The Red Cross truck serving food has been clean and food maintained appropriately throughout the operation
- 1630       Updated Mr Rabb, CDC, on status of Operation Safe Removal
- 1700       Special Staff meeting
- 1730       Screening and sickcall

27 January 1993

0700 Bussed to area

0715 Sickcall, BPs much more normal with new procedures

0800 Gave letter to police dept for Mr Bacon and COL Read's review

0830 COL Read wants the para on monitoring expanded

1040 1000 Friday meeting  
Develop a POC list  
Develop a document discussing constant improvement of medical support

1150 Called NCOICat TMC and requested throat losenges, cough syrup and chapstick

1155 Article on Khat given to MSG (Pharm & Tox 1992 Vol 70 pgs 77-86)

1300 Checked BPs recorded by EMS - acceptable

1730 Sickcall: 2 sorethroats, 1 sinus congestion, 1 head pain

1830 Departed Area

28 January 1993

0700 Departed Hotel

0715 Briefed EMS personnel. Sickcall - 1 rash, 1 cold sores, 1 muscle strain

1000 Received medical supplies from EA

1100 Drafted a letter to LTC Blough and attached a health risk assessment

1730 Sickcall and screening  
-2 sorethroats  
-1 URI

1745 Envelope for LTC Blough went by courier to EA. Will follow-up in a.m. to ensure he received it



29 January 1993

0700        Departed hotel

0730        Sickcall  
            - 1 chest congestion with cough  
            - 1 rash  
            - 1 sore throat

0800        Messline cleared

1200        After action draft completed

1510        LTC Blough received my note and HRA

1520        Talked to MSG Scott about medical support for security personnel for this weekend. I will inform him about medical support at WRAMC and civilian ambulance support.

1536        Spoke with CPT Everett, OIC of security force from Ft McNair, concerning medical support for his personnel over the weekend. Instructions posted in my area below medical sign.

1700        LTC Batt made Red Cross presentation.

1730        1LT Sanford promoted in pit to CPT

1800        Noone for sickcall

30 January 1993

0730        Departed for Spring Valley in POV

0800        Noone for sickcall

0815        Ambulance on-site. Will dismiss as soon as helicopters depart with rounds.

0930        Notified hotel that I will be returning Sunday

1 February 1993

0730        Departed hotel  
0745        Very few personnel in TEU area  
0940        COL Kenison wants 5 copies of med op plan  
1000        Sent soldier to ER for laceration with full thickness  
            skin flap  
1340        FAXd Kanjarpane's OER to Diane  
1400        Attended briefing for Dr Leffingwell  
1500        Departed for hotel

2 February 1993

0750        Departed hotel after checking out  
0815        Arrived Spring Valley  
0900        Alerted MDW NCO (E-7), SFC Robinson and MAJ Thompson  
            that they need to watch personnel for cold injury

# SAFETY

## After Action Report

3 February 1993

### 1. PURPOSE:

#### a. Introduction and Background:

- (1) Service Response Force Safety Officer.
- (2) Notification. Alerted on 7 Jan 1993 by the CBDA Risk Manager of the need to respond to the Spring Valley Site 8 Jan 93. Added Explosive Safety expert to team on. 11 Jan 93.
- (3) Time to departure. Approximately 10 hours.
- (4) Protective Mask. Protective masks are issued to safety personnel within the Edgewood RDEC Safety Office.
- (6) Supervisor. The Director Special Staff, Colonel Kenison.
- (7) Safety support. Tasked with providing staff safety and occupational health support to SRF Commander.
- (8) Time of arrival. Arrived at Spring Valley on at 1100 hrs on 8 Jan 93.
- (9) Work location. Special staff office in Emergency Operations Center.
- (14) Transportation on-site. Government transportation was used for travel to and from the site.
- (15) Equipment requirements. Environmentally controlled work area, desk/table, one chair per person, telephone, laptop computer with printer, software (wordperfect, procomm), office supplies, warm clothes and safety and occupational health regulations/policies.
- (16) Unavailable equipment.
- (17) Preparation for the mission. An emergency situation of this nature is difficult to prepare for. Time is really needed to get money, orders and the necessary clothes for the environment.

(18) Required personnel not present. In addition to the Explosive Safety expert mentioned above, the Edgewood RDEC Radiation Protection Officer arrived on-site 21-22 Jan 93 to assist in the set-up of the PINS and to perform a radiation protection survey of EOD X-ray operations. Additionally, future operations of this nature should have an industrial hygienist available on-site to establish occupational health parameters and sampling strategies.

(19) Deactivation. SRF deactivated 3 Feb 93.

b. Objectives. The following were the goals and objectives of the SRF Safety Officers.

(1) Serve to provide safety and occupational health guidance to the SRF and TEU Commanders on methods to reduce the risk of injury to operating personnel.

(2) Provide interim hazard classification documentation required to ensure the safe transportation of munitions.

(3) Serve as a liaison with AMC, DA and DOD Safety personnel to answer questions operational safety concerns and to seek relief from regulations , if necessary.

(4) Provide chemical hazard information (i.e. Material Safety Data Sheets (MSDSs)) to the on-site commander for his use in educating workers and establishing proper levels of safety.

## 2. OPERATIONAL SUMMARY:

a. Developed an initial risk assessment prior to operations (11 Jan 93).

b. Revised risk assessment to include hazards associated with both chemical and explosive materials. (23 Jan 93)

c. Continually provided guidance on methods to improve both the monitoring and protective clothing levels for all facets of this operation.

d. Developed a chronology of safety improvements that evolved out of risk assessment development.

e. Produced a listing of safety and health concerns associated with chemicals used at American University.

f. Developed SRF Command Safety Rules of Engagement for Operation Safe Removal.

### 3. OBSERVATIONS AND RECOMMENDATIONS:

a. Lessons Learned and Unresolved Problems. The safety and occupational health lessons learned and unresolved problems associated with this operation are contained in appendix VII.

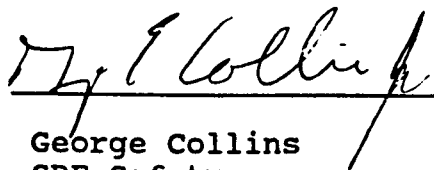
b. Conclusion. The mode of operation for this effort was continual improvement. As the chronology contained in Appendix VIII shows, significant safety improvements were made on a daily basis. The major role safety served in this operation, was to assess the risk and provide on-site commanders with the necessary information to make key risk decisions. Additionally, this effort showed the value of the safety resources within the Edgewood RDEC Safety Office. An enormous amount of effort went into the development of risk assessments/interim hazard classifications and researching safety and health information pertaining to the potential chemicals used at the American University.

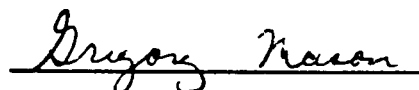
### 4. APPENDICES:

- I. Initial Risk Assessment
- II. Revised Risk Assessment
- III. Chronology of Safety Improvements to the Site
- IV. SRF Commander Safety Rules of Engagement
- V. Listing of Safety and Health Concerns Associated with Chemicals Used at American University.
- VI. Interim Hazard Classifications for Transportation
- VII. Lessons Learned
- VIII. Chronology of Work
- IX. List of Equipment to be Provided by SRF

X. List of Personal Equipment/References to be Brought by the Safety Consultant.

XI. Key Personnel Contacts

  
George Collins  
SRF Safety

  
Greg Mason  
SRF Safety

**APPENDIX I  
INITIAL RISK ASSESSMENT**

11 JAN 93

SCBDR (385(A))

**MEMORANDUM FOR RECORD**

**SUBJECT:** Risk Assessment for Safe Removal of Chemical Filled Unexploded Ordnance at the American University Chemical Warfare Center Site

**1. REFERENCES.**

a. Technical Paper No. 10, Methodology for Chemical Hazard Prediction, DDESB, June 1980.

b. AR 385-61, The Army Toxic Chemical Agent Safety Program, 3 Nov 1992.

2. **PURPOSE.** The purpose of this assessment is to detail the chemical risk associated with performing safe removal of found munitions at the subject location in Washington, D.C. This document will show that using a combination of protective clothing and area monitoring will be adequate to ensure that personnel will not be exposed to chemical hazards that could cause injury while performing operations under TEU SOP # TU-0000-M-013.

**3. OPERATION DESCRIPTION.**

a. The Technical Escort Unit (TEU) has been given the task to expeditiously and safely remove found munitions to another site for proper disposition. The concept of operation is three-fold. The land was used during World War I as a site for the development of chemical warfare materiel.

b. The TEU is using SOP NO: TU-0000-M-013, SOP For Explosive Ordnance Disposal (EOD) Response, dated 17 July 1992.

c. Any number of possibilities can be encountered by the TEU response team. Some of these follow:

(1) munition has visible liquid contamination and test positive.

(2) munition is a slosher with no visible or detectable contamination.

(3) munition is a slosher with no visible contamination, but tests positive for vapor contamination.

(4) munition has all the characteristics of a chemical filled round, but neither sloses nor tests positive.

(5) munition is unidentified with no visible signs of leakage.

(6) munition has a conventional fill.

d. For possibilities (1) thru (5) the munition is placed in a 6 mil plastic bag to allow vapors to collect for future monitoring. Possibilities (1) is left as is and possibility (6) is either transported to the safe storage site.

2. GENERAL SAFETY ANALYSIS. The potential chemical agent hazards associated with this operation stem from exposure to the mustard, phosgene, cyanogen chloride, lewisite and chloropicrin. Mustard is a vesicant or blister agent. Vesicants act on the eyes, lungs, and skin; and burn and blister the skin or any other parts of the body they touch. They damage the respiratory tract when inhaled and cause vomiting and diarrhea when absorbed. Some vesicants have a faint odor, others are odorless. They are often insidious in action and there is little or no pain at the time of exposure. Thus, in some cases, sign of injury may not be apparent for several hours. Of particular importance is the fact that mustard has been declared to be a known human carcinogen and therefore must be handled IAW the strict standards for the use of these substances as well as those pertaining to surety materials.

Lewisite is a blister agent. Lewisite acts similiarly to mustard with the exception of the fact that skin exposure results in instant pain. Lewisite is rapidly hydrolyzed in the vapor state.

Phosgene (CG) choking agent. Phosgene acts on the nose, throat, and particularly the lungs. In extreme cases membranes swell, lungs become filled with liquid, and death results from lack of oxygen. The rate of action can be delayed for more than 3 hours.

Cyanogen chloride (CK) blood agent. These agents are absorbed into the body primarily by breathing. They affect body functions through action on the enzyme, cytochrome oxidase, thus preventing the normal use of oxygen by the cells and causes rapid damage to body tissues.

Chloropicrin (PS) tear producing agent. Tear producing agents can cause transient casualties. It is a powerful lacrimatory agent and is an irritant to the respiratory tract. At higher concentrations it is irritating to the skin. The effects of exposure are cumulative and long lasting. It may cause the effect of the central nervous system for weeks.



### 3. HAZARD ANALYSIS.

A. Possible Scenario. In hypothesizing the ways in which TEU personnel could be exposed to a chemical agent hazard, the scenario that is most likely is a worker uncovering a leaking munition. It is possible that when TEU personnel walk up to a excavation pit which contains exposed rounds, a round could be leaking. It is more likely however that workers could encounter a chemical exposure when either digging in the soil around the site or when handling rounds. After contact with the agent, the operation would cease and the exposed personnel would be removed from the site. Upon finding suspect chemical filled rounds, gross level checks (M18A2 and/or CAM) are made. If the round is suspected of containing chemical agent, it is wrapped in plastic and carried to a safe area.

#### C. Risk Assessment.

a. There are three possible routes of exposure to agent during this operation: vapor to skin, liquid to skin, and inhalation of vapor. If personnel performed this operation WITHOUT protective clothing and a release of chemical agent were to occur, injury would be likely. Since an exposure to any chemical agent would be detrimental to this operation, this has a hazard severity of catastrophic. The probability of exposure of personnel to the skin by vapor is reasonably probable since the workers skin would be exposed to the air. The probability of vapor exposure through inhalation is frequent because if there is a spill, the probability of a worker inhaling chemical agent vapors is high. The routes of exposure therefore have the following risk assessment codes:

1. Vapor to skin: IV-B, negligible-probable.
2. Liquid to skin: IV-D, negligible-remote.
3. Inhalation of vapor: I-B, catastrophic-probable.

b. In order to reduce or eliminate the hazard to personnel, the following are choices of corrective actions in order of preference:

1. Eliminate the worker from the operations through engineering controls.

2. Monitor the operation with real-time monitors.

3. Dress the operator in protective clothing and equipment.

? c. The option of engineering controls is presently impossible. The site is not conducive to erecting these controls. The option of monitoring is an option, but not one that is going to prevent exposure as real time breathing zone monitoring technology at the real time no effects level breathing zone monitoring for phosgene, CK, Chloropicrin. The only option left is to perform the operations in protective clothing and equipment.

d. Three choices of protective clothing were considered: modified TAP level A, level C (mask without apron) and level D (no mask). If modified level A were worn by operators, the severity would remain the same (catastrophic). The reason for this is that personnel are being sent into the hazard area. The probability of exposure would be reduced to improbable since the SCBA will eliminate the inhalation hazard. Because the risk of skin exposure is extremely improbable, the use of rubber is unnecessary.

? e. If Level C (without rubber apron and with tyvek) were worn, the severity would remain the same (cat.). Again the M17 mask would provide the necessary protection from the inhalation hazard. ?

g. If Level D were worn, the severity and probability of inhalation from the the chemical agent listed would not be reduced from the original risk assessment (I-A) >

clothing may change according to the situation encountered.  
Those situations are:

1. munition has visible liquid contamination and tests positive. (Mod Level A will be worn)
2. munition is a slosher with no visible contamination but tests positive for vapor contamination (Mod Level A will be worn)
3. munition is a slosher with no visible or detectable contamination (Level C will be worn)
4. munition has all the characteristics of a chemical round but neither sloshes nor tests positive ( Level C to be worn)
5. munition is unidentified with no visible signs of leakage ( Level C to be worn)
6. munition has a conventional fill (Level D to be worn)

h. Based on the above information, the probability of vapor and liquid exposure to the operator can not be reduced unless adequate (M17/M9) respiratory protection is worn when handling/assessing suspected chemical filled UXO or entering the pits/trenches. Based on the information above involving the air concentrations that would be encountered, the M17 mask would reduce the probability of inhalation of vapor to improbable.

j. The resulting RAC, after corrective actions (protective clothing) are as follows:

b. MOD Level A:

1. Vapor (skin): IV-E (negligible-improbable)
2. Vapor (inhalation): I-E (cat-improbable)
3. Liquid (skin): IV-E

b. Level C (without apron)

1. Vapor (skin): IV-B
2. Liq (skin): IV-D
3. Vapor (inhal): I-E

c. Level D

1. Vap (skin): IV B
2. Liq (skin): IV D
3. Vapor (inhal): I B

C. CONCLUSION. The risk of inhalation exposure to the chemical agents listed above to personnel during this operation can be reduced similarly by using MOD Level A or Level C. The decision to be made on whether or not to wear a mask during intrusion of the soil by TEU work party is the major issue with this risk assessment. The risk of each option is as follows:

(1) Soil intrusion with mask: I-E-3 Risk of injury is improbable.

(2) Soil Intrusion without mask is: I-B-1 Risk of injury if a leaking munition is found is probable.

and  
Once a munition is uncovered, an initial assessment has been made the following potential scenarios would then take place. Since the situations at the site will vary the level of protective

Based on the above risk analysis the undersigned agree to:

WTB [Signature] Have workers wear Level C (with mask and Tyvek) during soil intrusion.

WTB [Signature] Have workers wear Level D (without mask) during soil intrusion.

WTB [Signature] As an added precaution, workers will provide for additional decon of gloves and boots during the operation. Protective outer clothing will be completely changed out after each exit from the site.

Submitted:

William T. Batt

William T. Batt  
LTC, CM  
Commander, TEU

Approved:

[Signature]

George R. Friel  
BG, USA  
Commander, SRF

Blank

APPENDIX II  
REVISED RISK ASSESSMENT

DECISION. Based on the risk assessment, dated 23 Jan 93, the following safety precautions are directed to be implemented:

ENGINEERING CONTROLS

DATE IMPLEMENTED	CDR INITIALS	
<u>21 JAN 93</u>	<u>✓ [Signature]</u>	Provide local exhaust for the pit.

PERSONAL PROTECTIVE CLOTHING IN PIT

_____	_____	Modified Level A
_____	_____	Level A
_____	_____	Level B
<u>26 JAN 93</u>	<u>✓ [Signature]</u>	Level C with Saranex/Tyvek <i>IN ASSESSMENT AREA</i> A S MCTER WORK ZONE.
_____	_____	Level C
<u>6 JAN 93</u>	<u>✓ [Signature]</u>	Level D with Saranex/Tyvek <i>for working in the pit</i> AREA during ROUTINE EXCAVATION OPERATIONS. LEVEL C
_____	_____	Level D <i>BE WORN WHEN HANDLING <del>unknown</del> suspect</i> CHEMICAL MUNITIONS.

MONITORING

12 JAN 93 ✓ [Signature] The RTAP be used for first entry monitoring for mustard and background real-time low-level monitoring for mustard in the pit. Additionally, the following monitoring should occur:

- 12 JAN 93 (1) Background low-level (bubblers) monitoring for lewisite.
- 12 JAN 93 (2) Breathing zone sampling for mustard using DAAMS tubes.
- 24 JAN 93 (3) Continuous background sampling for phosgene in the pit.

DATE IMPLEMENTED CDR INITIALS

12 JAN 93 UAB *see above UAB* The RTAP be used for first entry monitoring for mustard and background real-time low-level monitoring for mustard in the pit. Additionally, the following monitoring should occur:

12 JAN 93 (1) Background low-level (bubblers) monitoring for lewisite.

12 JAN 93 (2) Breathing zone sampling for mustard using DAAMS tubes.

12 JAN 93 UAB The RTAP be used for first entry monitoring for mustard and background real-time low-level monitoring for mustard in the pit. Additionally, the following monitoring should occur:

12 JAN 93 (1) Background low-level (bubblers) monitoring for lewisite.

12 JAN 93 UAB The RTAP be used for first entry monitoring for mustard and background real-time low-level monitoring for mustard in the pit.

#### WORK ZONES

*By exception as required* 11 Jan 93 UAB Establish the pit as a special work zone for increased level of respiratory protection.

5 JAN 93 UAB Establish hot line / EPDS

5 Jan 93 UAB Establish public exclusion area during operating hours.

                                          Do not establish the pit as a special work zone for increased level of protection.

Directed:

William T. Batt  
William T. Batt  
LTC, CM  
Commander, TEU

Approved:

George R. Friel  
George R. Friel  
BG, USA,  
Commander, SRF



23 JAN 93

MEMORANDUM FOR RECORD

SUBJECT: Revised Risk Assessment for Safe Removal of Chemical Filled Unexploded Ordnance at the American University Chemical Warfare Center Site (Operation Safe Removal)

1. REFERENCES.

a. Technical Paper No. 10, Methodology for Chemical Hazard Prediction, DDESB, June 1980.

b. AR 385-61, The Army Toxic Chemical Agent Safety Program, 3 Nov 1992.

c. AMCR 385-100, Safety Manual, 1 Aug 85.

d. FM 3-9, Potential Military Chemical/Biological Agents and Compounds, 12 Dec 90.

e. American University Data Base

f. EA Tech Report, The Search for Toxic Chemical Agents, Benjamin Wittin, PHD, Nov 69.

g. AR 385-64, Ammunition and Explosive Safety Program

h. TM 9-1300-214, Military Explosive chemical Compounds

i. TM 5-1300

2. PURPOSE. The purpose of this assessment is to update the 11 Jan 93 risk assessment developed in support of Operation Safe Removal. During the past ten days, enormous efforts have been made to continually review both the protective clothing and monitoring equipment on-site for this operation. The overall impact has been a reduction in the risk of chemical related injury. The safety and health of the soldiers and civilians charged with this mission is priority one. As with the 11 Jan 93 risk assessment, this update will show that the combination of protective clothing and area monitoring will provide the SRF Commander with options to minimize the risk of injury while performing operations under TEU SOP # TU-0000-M-013.

3. OPERATION DESCRIPTION.

a. The Technical Escort Unit (TEU) has been given the task

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SUBJECT: Revised Risk Assessment for Safe Removal of Chemical Filled Unexploded Ordnance at the American University Chemical Warfare Center Site (Operation Safe removal)

to expeditiously and safely recover, package, and remove exposed potentially explosive or chemically hazardous munitions or debris. This site was used during World War I as a site for the development of chemical warfare materiel.

b. The TEU continues to work under SOP NO: TU-0000-M-013, SOP For Explosive Ordnance Disposal (EOD) Response, 17 July 1992. To prevent personnel exposure a combination of protective clothing and general area/personal breathing zone monitoring is already being employed.

c. The range of potential chemical related munitions possibilities is defined in the 11 Jan 93 risk assessment and has not changed.

#### 4. GENERAL SAFETY ANALYSIS.

a. The potential chemical hazards associated with this operation are numerous. At this point, the primary chemicals of concern are those traditionally used as fills for munitions. The chemicals of concern include mustard (H), lewisite (L), phosgene (CG), adamsite (DM), bromobenzylcyanide (CA), titanium tetrachloride (FM), chlorine (CL), bromoacetone (BA), cyanogen chloride (CK), sulfur trioxide-chlorosulfonic acid mixture (FS), chloropicrin (PS), fuming sulfuric acid and chloropicrin mixed with stannic acid (NC). The potential explosive hazards are 2,4,6 - Trinitrotoluene and Amatol.

b. Mustard (H). H is a vesicant or blister agent. Vesicants act on the eyes, lungs, and skin; and burn and blister the skin or any other parts of the body they touch. They damage the respiratory tract when inhaled and cause vomiting, diarrhea and a reduction in white blood cell count when absorbed. Some vesicants have a faint odor, others are odorless. They are often insidious in action and there is little or no pain at the time of exposure. Thus, in some cases, sign of injury may not be apparent for several hours. Of particular importance is the fact that mustard is a known human carcinogen and therefore must be handled IAW the strict standards for the use of these substances as well as those pertaining to surety materials. The freezing point of mustard is 58 degrees F.

c. Phosgene (CG). Below 47 degrees F, or under pressure in munitions, CG is a colorless liquid. It boils at 47 degrees and has the odor of fresh-cut hay. When inhaled, it irritates the lungs and causes pulmonary edema. The first symptoms noted in a strong concentration are: pronounced and almost uncontrollable

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coughing, together with a choking sensation, a feeling of tightness in the chest, occasional vomiting, headache, and lacrimation. The danger, however, lies in the fact that low concentrations that are not particularly irritating may, after an interval of several hours, produce serious respiratory symptoms and even death. Symptoms appearing after a time interval are difficulty in breathing, rapid pulse, weakness, coughing with watery expectoration, and cyanosis. (ref. 1c)

d. Chloropicrin (PS). PS is a pungent, colorless, oily liquid. It is very volatile and is usable during any season to produce incapacitating or lethal concentrations. PS is a powerful irritant whose vapors cause nose and throat irritation, coughing, and vomiting. As an eye irritant, it produces immediate burning, pain, and tearing. Even in very limited concentrations, PS causes the eyelids to close. In high concentrations, PS damages the lungs, causing pulmonary edema. In liquid form it causes severe burns on the skin that generally result in blisters and skin lesions. PS decomposes into chlorine gas and nitrogen oxide near open fires, producing additional toxic vapors. The freezing point of PS is -91 degrees F. (ref 1d)

e. Lewisite (L). L is an arsenical vesicant. It is a liquid with an odor of germaniums or very little odor when pure. It produces effects similar to mustard. One main difference is that L produces immediate pain. Liquid L causes immediate burning sensation in the eyes and possible permanent loss of sight. It has about the same blistering action on the skin as does H, even though the lethal dosage for L is much higher. Skin exposure to L produces immediate pain and reddening of the skin starts in 30 minutes. Blistering will be well developed in 12 - 13 hours. Skin burns are deeper from L exposure than from H. When inhaled in high concentrations, lewisite may be fatal in as short a time as 10 minutes. The freezing point of L is between -18 and - 0.1 degrees C depending on the purity. (ref 1d)

f. Cyanogen Chloride (CK). CK is a blood agent. It is a colorless, highly volatile liquid with a pungent, biting odor that will go unnoticed because CK is highly irritating to the eyes and mucous membranes. CK irritates the respiratory tract similar to phosgene; fluid may accumulate in the lungs much faster than in phosgene poisoning. CK is highly irritating to the eyes and mucous membranes. CK is a lethal agents due to interference with the use of oxygen by the body tissues. High concentrations may degrade the filter of protective masks and reduce the masks protective capabilities. The boiling point of

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CK is 55 degrees F. It will polymerize to form the solid cyanuric chloride which is corrosive. Impurities promote polymerization which could become explosive. (ref 1b)

g. Bromobenzylcyanide (CA). CA is a tear-producing compound. It produces a burning sensation of the mucous membranes and severe irritation and tearing in the eyes with acute pain in the forehead. It is a yellow solid or liquid, depending on temperature and purity. CA was the most powerful tear-producing agent used in World War I. (ref 1f)

h. Bromoacetone (BA). BA is a tear-producing compound. It is a colorless liquid. The boiling point is 135 degrees C (275 degrees F). It is a lachrymator and a vesicant as a liquid. It forms blisters which heal rapidly but are very painful. (ref 1e)

i. NC (Mixture of PS and Stannic Acid). Same effects as chloropicrin (PS).

j. Titanium tetrachloride (FM). FM is a heavy colorless liquid acid-type agent with a pungent odor. It can be readily detected by the large quantity of smoke produced when it leaks. It is used solely to produce smoke and has slight toxic effects; however, protective masks are required. Liquid FM will cause acid burns to the skin. Large quantities of smoke produce a choking sensation and causes difficulty in breathing, thus a protective mask is required for the comfort of the worker. Heavy concentrations in enclosed places can result in serious injury. The liquid can be removed with large quantities of water. In extremely heavy concentrations, canisters of protective masks may become clogged to such an extent as to render breathing difficult. If this occurs, mask or canisters must be exchanged for others in serviceable condition. Spillage can be removed by washing with large quantities of water. The freezing point of FM is - 11 degrees F. (ref 1c)

k. Sulfur trioxide-chlorosulfonic acid mixture (FS). This is a heavy liquid acid-type agent which fumes strongly in air and decomposes above 154 degrees F. It has an acrid odor. It is used solely as a smoke-producing agent. Exposure to heavy concentrations may cause severe irritation to the skin, eyes and respiratory tract. Inhalation of concentrated fumes causes coughing and strangulation, a feeling of constriction around the chest, burning of the nose and throat and hoarseness. When the mixture comes in contact with moisture, it forms hydrochloric acid and sulfuric acid. These acids are very corrosive to metals and fabrics. If FS is applied directly to the skin, a burning

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sensation is felt at once and an acid burn follows. Any FS mixture on the skin or clothing should be thoroughly wiped off with a dry cloth and the contaminated area flushed with large amounts of water. FS mixture is nonflammable, but may cause fires if spilled on flammable material, particularly under damp conditions. Spillage can be removed by washing with large quantities of water. Small quantities of water added to FS reacts violently. (ref 1c)

l. Adamsite (DM). DM is a vomiting compound. It produces strong pepper-like irritation in the upper respiratory tract, with irritation to the eyes and tearing. It causes violent uncontrollable sneezing; cough; nausea; vomiting; and a general feeling of bodily discomfort. DM is a solid (light yellow to green crystals). It produces its effects by inhalation or by direct action on the eyes. (ref 1d)

m. Fuming Sulfuric acid. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes and skin. Inhalation may be fatal as a result of spasm, inflammation and pulmonary edema. Reacts violently with water. (ref MSDS)

n. 2,4,6 Trinitrotoluene. Historical files show that Trinitrotoluene (TNT) was the standard fill for both the payloads and bursters in most of the candidate rounds. Although 50/50 amatol was also used as a fill for 75mm MK III HE projectiles, the quantity (1.61 lbs) was less than the TNT fill (1.66 lbs). Because amatol 50/50 is a little less impact and initiation sensitive than TNT, and only a little less stable than TNT, assumptions made about TNT munitions are accepted for Amatol 50/50 fill munitions. TNT is a yellow, crystalline compound with a molecular weight of 227.13, melting point of 80 to 81 degree C, and boiling point of 345 degree C. At ordinary temperatures TNT is essential nonvolatile. TNT is one of the least sensitive of military explosives. Impact tests yield high values relative to other military explosives. TNT has high minimum detonating charge values from initiation by primary explosives. The presence of only 7% moisture prevents detonation by a #6 blasting cap. TNT is not classified as dangerous with respect to electric sparks. When ignited in free air, TNT dust burns completely without detonation. TNT shows no deterioration after 20 years of magazine storage. Therefore, it must be considered stable and does not deteriorate over time. TNT require relatively high external stimuli to initiate detonation. An intact explosive train (detonation wave) is essential for initiation.

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e. To support safe chemical operations, safety zones of 10 meter (around the immediate pit), 150 feet (the hot line), and 300 meters (civilian evacuation zone) have been established. Each zone serves to control access and limit the potential exposure population.

## 5. HAZARD ANALYSIS.

a. Risk Assessment Codes. The risk assessment codes used in this document were taken from AR 385-10. A description of these codes is attached as enclosure 1.

b. Possible Chemical Scenario. As with the 11 Jan 93 risk assessment, the most likely exposure to the above chemicals is going to occur when TEU personnel are either digging in the soil around the site or when handling the munitions. Upon finding suspect chemical filled rounds, gross level checks (M18A2 and/or CAM) are made, the round is thoroughly examined, placed in plastic, X-rayed and finally placed in shipment containers for transport. In the event there is contact with a chemical agent or the detection of a chemical agent with monitoring devices, the operation would cease and the exposed personnel would be safely removed from the site to receive appropriate medical attention.

c. Chemical Risk Assessment. In defining the risk of exposure to the above listed potential chemical fills, one must look at possible routes of entry into the body and then determine the manner best suited to reduce potential exposure. The possible chemical agent hazards to be considered for this operation are: vapor to skin, liquid to skin, and inhalation of vapor.

### (1) Dermal route of entry.

(a) Mustard and adamsite. The low temperatures at the site (averaging below freezing) significantly reduce the liquid and vapor to skin hazards for mustard and adamsite. Both of these compounds will be solid at current temperatures.

(b) CG, PS, NC, and BA. The toxicological literature has not shown passage into the body through the skin to constitute a significant hazard with these chemicals.

(c) Lewisite, fuming sulfuric acid, FS, and FM. The major dermal chemical hazards at this point are Lewisite, fuming sulfuric acid, FS, and FM. Lewisite at these temperatures could remain as a liquid and could permeate readily through most protective clothing and to the skin. Likewise fuming sulfuric

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acid, FS, FM and their degradation products, pose a significant acid hazard to the skin.

(d) In summary, the risk of chemical injury through dermal contact (either vapor or liquid) without protection is II-B, critical-probable.

(2) Respiratory route of entry.

(a) The overwhelming concern at this point of the operation is vapor inhalation from Lewisite, Phosgene, PS, CK, FM and NC. Calculations developed by Mr. Mike Myirski (enclosure 2) show that even a small release of a chemical agent like Lewisite will produce an area 10 meters in diameter that is above the Surgeon General's Airborne Emission Level (AEL).

(b) It is clear from the above scenario that the probability of vapor exposure through inhalation is probable because if there is a chemical agent release before it is visibly detected, the probability of a worker inhaling chemical agent vapors is high. Therefore the risk of respiratory contact with chemical agent vapors (i.e. Lewisite, Phosgene) without protection is I-B, catastrophic-probable.

(3) Reduction of the risk. The 11 Jan 93 risk assessment described three methods to reduce the risk of chemical agent injury. This assessment will recount the three and add a fourth. The methods follow:

(a) Engineering Controls. This concept is to reduce risk by containing or ventilating the hazard. The option of engineering controls is presently very limited at the Spring Valley site. The only viable engineering control available at this time is to provide a local exhaust system for the pit. This would eliminate many of the potential chemical vapor hazards in the pit. Unfortunately, this method will not remove all vapor hazards and would not negate the need for respiratory protection if a leaking round is encountered.

(c) Protective Clothing. This concept is to reduce risk by providing protective clothing and equipment to isolate the worker from the hazard. The options are as follows:

(1.1) Modified Level A. This ensemble is a M3 butyl rubber suit, boots, gloves, air hose sleeve with a M30 hood and Self-Contained Breathing Apparatus (SCBA). This ensemble is not a positive pressure system, but provides total

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body contact protection agent chemical agents. This ensemble is approved for Immediately Dangerous to Life and Health (IDLH) and is the DA Safety recommended (AR 385-61) level of protection for work in unknown environments to include work with suspect mustard and lewisite contamination. With the above level of protection, the risk of dermal chemical injury is II-E, critical and improbable. The respiratory chemical injury risk is I-E, catastrophic-improbable.

(1.2) Level A. This ensemble is a M3 butyl rubber suit, boots, gloves, hood with a M9 military mask. This ensemble is not a positive pressure system and is not approved for IDLH environments. It does however provide total body contact and respiratory protection against a wide range of chemical agents. With the above level of protection, the risk of dermal chemical injury is II-E, critical and improbable. The respiratory chemical injury risk is I-D, catastrophic-remote.

(1.3) Level B. This ensemble is a M3 butyl rubber suit, boots, gloves, apron and a M9 or M17 military mask. This ensemble provides dermal splash protection to the hands, arms, and front of body and feet. It provides respiratory protection against a wide range of chemical agents. With the above level of protection, the risk of dermal chemical injury is II-D, critical and remote. The respiratory chemical injury risk is I-D, catastrophic-remote.

(1.4) Level C. This ensemble consists of gloves, boots and the M9 or M17 military mask. This level provides dermal protection for the hands and feet. TEU has modified this level by adding Saranex/Tyvek chemical resistant body suits for additional dermal protection. It provides respiratory protection against a wide range of chemical agents. With Level C (with Saranex/Tyvek suit) the risk of dermal chemical injury is II-D, critical and remote. The respiratory chemical injury risk is I-D, catastrophic-remote.

(1.5) Level D. This ensemble consists of butyl gloves and boots with coveralls. A M9/M17 military mask is slung for emergency egress. This level provides dermal protection for the hands and feet. It provides no respiratory protection against chemical agents. TEU has modified this level by adding Saranex/Tyvek chemical resistant body suits for additional dermal protection. Level D (with Saranex/Tyvek suit) generates the following risk of dermal chemical injury is II-D, critical and remote. The respiratory chemical injury risk is I-B, catastrophic-probable.



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(b) Monitoring. This concept is to reduce risk by monitoring the air to provide warning of hazards. The options are as follows:

(1.1) First Entry Monitoring (FEM) of the pit is possible for mustard with the Real Time Analysis Platform (RTAP). The RTAP combines a gas chromatograph with an automatic continuous environmental monitoring system that collects compounds on a solid sorbent trap, thermally desorbs them into a capillary gas chromatography column, and detects the compound with a flame photometric detector. It is a low level monitor designed to respond to 0.003 mg/m<sup>3</sup> for mustard in less than 15 minutes with alarm capability. Unfortunately, this method is good for one chemical agent, mustard, and has a 15 minute delay in response. This would not negate the need for respiratory protection if a round had been leaking before first entry.

(1.2) The RTAP also has the capability to provide continuous low-level real-time monitoring for mustard in the pit and to provide an on-site screening analytical capability (mustard and lewisite) for other samples (soil and air) from around the site. Unfortunately, this method is limited in the chemicals it can search for and has at least a 15 minute delay in response. This would not negate the need for respiratory protection if a leaking round is encountered.

(1.3) Another form of monitoring involves breathing zone sampling using Depot Area Air Monitoring (DAAMS) tubes. This method will document exposure to mustard, but unfortunately will not prevent exposure. These samples could be analyzed daily and will provide a low-level historical account of worker exposure.

(1.4) In the event TEU personnel suspect contamination with cyanogen chloride, phosgene, sulfuric acid, arsine or chloropicrin, Draeger detection tubes are available to provide area monitoring. This assessment can be made with the use of commercially available detection tubes for the materials. However, due to the target chemicals high volatility, effective capture of representative samples of suspect liquid is not assured. Unfortunately, this level of monitoring will not serve to prevent exposure, but will be used to document the presence of targeted chemical hazards in the area.

(d) Administrative Work Zones. The concept is to reduce overall risk by reducing the number of people at risk or by establishing different protective requirements from one zone

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to another. The calculations shown as enclosure 2 show a realistic Lewisite inhalation hazard within a 10 meter area around the pit in the event a spill were to occur. The work zone approach would create an area that could be marked off which would require all workers entering the area of concern to be an increased level of respiratory (i.e. SCBA/M17 mask) and dermal (i.e. butyl rubber suit) protection. This would reduce the risk of injury regardless of the chemical agents encountered. Workers outside this area would remain in Level D (mask slung) unless an emergency situation (i.e. leaking munitions) were encountered. This method will reduce the number of workers required to wear protective clothing by establishing levels of protection based on work location.

d. Explosive Risk Assessment.

1. Explosive Scenarios. Detonation of either a HE round, or of the TNT mixed in the soil are the possible two scenarios. Because of TNT stability, relatively high external stimulation initiation requirements, and total desensitizing to initiation by 7% moisture, detonation of loose TNT found mixed in the soil is not a credible scenario.

2. The remaining scenario is credible. Although the probability is low, a round could detonate during any of the following handling scenarios: during initial uncovering/excavation and handling within the pit; during assessment (identification) procedures; during packing; or shipment.

3. To date, 3" stokes HE mortars, 3" WP Stokes Mortars, 75mm HE Projectiles, 75mm WP Stokes Mortar, and WP initiators are the likely identities of the recovered conventional munitions. Of these, the 3" strokes HE mortar has the largest HE (2.5 lbs) and WP (1.6 lbs) payloads. The potential smoke and other solid fills would not generate detonation waves, and any resulting deflagration would be less hazardous than an HE detonation..

(a) The maximum amount of explosive contained in any explosive component of currently identified possible chemical rounds (3" stokes mortar, 75mm projectile, and Levins projectile) is 100 grams.

(b) The rounds are handled one at a time. Therefore, any incident /detonation during handling or assessment would only involve one round.

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(c) Military fuzes have safety and arming devices. Unless these devices are damaged, removed (safety pins), missing (bore safe pins), or other indications that the round may have been fired, these rounds should not be armed. Some fuzes require stimuli close to normal functioning forces (set back) to arm undamaged fuzes. Range duds should have been detonated in place upon discovery in 1919 and not disposed of in the pit. Therefore, while remote there is a probability that armed fuzed munitions will be found during excavation activities. TEU personnel are EOD trained to identify and determine if fuzes are armed. They have specific instruction and techniques for handling armed munitions. Due to this training and the nature of TNT, there is only a remote probability that a round would detonate during assessment and handling. Due to the difficulty of initiation of TNT, the probability of round detonating should be significantly reduced for unfuzed HE rounds.

(d) Due to TNT's stability, lack of relative sensitivity, and difficulty of initiation, the greatest hazard will exist during any handling prior to determining if the fuze is armed and functional.

(e) Bursting devices installed in WP rounds would not create the overpressure that the HE rounds would produce. Any actions taken to protect personnel against the effects of a HE detonation would also protect personnel from the effects of initiation of a WP round.

(f) The detonation of a fuzed 3" Stokes HE mortar (highest HE fill of candidate rounds) during initial handling within the pit would be the maximum credible event. This scenario would also produce the probable maximum fragmentation hazard array and expose the most personnel.

#### 4. Explosive Hazard Analysis.

(a) The accepted amount of overpressure that the human body can withstand and not suffer damage is 2.3 psi. Eardrums will rupture at 3.4 psi and lungs will rupture at 5.4 psi.

(b) Engineering controls are not a viable option at the site. There is no known portable remote control equipment which could perform the excavation and initial handling. Standard substantial dividing walls or barricades are not available or viable option to obtain. Pallets of bricks are

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available on site and could be positioned to act as shields around explosive storage location. These barricades should be effective in preventing low level fragments from striking the storage containers in the event of a explosion at another on site location. It is improbable that these makeshift barricades would contain the effects of a detonation within the storage container. The bricks would likely become secondary fragments. However, it is also improbable that stored rounds will spontaneous detonation with out an external stimulus based on the characteristics of TNT.

(c) Administrative controls are a effective means of limiting both the number of personnel exposed to the hazard and the severity of the hazard. Only the minimum number of personnel are allowed down range due to the potential explosive and chemical threat.

(d) Personnel protective clothing would provide only marginal additional protection. Flack jackets and military helmets would provide a measure of protection from fragments. However, the head would still be significantly exposed. The jacket should provide additional protection to most vital organs. However, nether provides protection from the expected overpressure which would be generated close to a high order detonation.

(e) Risk from found HE rounds. The primary hazard from the detonation would be the resulting overpressure. Separation of all but essential personnel from the explosives provides the best protection. Personnel exposed to 2.3 psi would not experience any harmful effect. Inhabited building distance (IHB) ensures that unprotected personnel are not subject to overpressure above 2.3 psi as the result of an unintentional HE detonation. Required IHB separation distance is determined by the equation  $d = 40w^{1/3}$ . Therefore, 58 feet is the minimum separation distance to unrelated personnel which would provide minimum protection from overpressure from the maximum credible event. For the expected quantity of HE (less than 100 lbs) that will be recovered during excavation, the regulatory default fragmentation safety distance (670') will protect personnel from both primary and secondary fragments. Nonessential personnel are required to evacuation from a 984' clear zone daily before operations can begin. Therefore, the risk of exposure of nonessential personnel (i.e., civilians) to harmful overpressure or fragments is assessed as I-E catastrophic - improbable.

(f) Assessment of chemical munitions explosive

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risk. Detonation of 100 grams of TNT would produce predicted overpressures of 270 psi and 3.4 psi at 1.5 feet and 7.6 feet, respectively. This occurrence would be lethal to personnel handling the munitions, and as a minimum, rupture the ear drums of personnel within 7.6 foot radius. Primary and secondary fragment are also likely, but the overpressure is the far greater hazard to handlers. Risk assessed for operators in the immediate vicinity (within 1.5 feet) if a chemical round detonate is I-A Catastrophic - frequent. At IHB distance (26 feet) predicted overpressures should be reduced to 2.3 psi and fragmentation would become the major risk. The walls of the pit should provide a measure of protection from low flying fragment. Therefore, the risk assessment for operators outside of the pit (a minimum of 30 feet from the detonation) is I - D Catastrophic - remote

(g) Assessment of maximum credible event. Detonation of a HE round would have the same results for personnel in the immediate area as a chemical round, but would increase to ear rupture zone to approximately 54' and IHB distance (2.3 psi) to 58 feet.

(h) Intraline separation distance prevents the detonation wave from initiating other rounds in the area. The formula  $d = 18w^{1/3}$  will provide safe separation distance between the operations explosive locations. The maximum credible event's net explosive weight (NEW) (2.5 lbs) would require a minimum of 26 feet between the pit, assessment, and storage locations to prevent propagation between explosive sites. Current separation between these site exceed this requirement. Risk of propagation is assessed as I-E catastrophic - improbable.

(i) Risk from primary and secondary fragmentation to civilian personnel. A fragmentation hazard is also associated with the HE and Chemical rounds. The DOD default separation distance to protect personnel from hazardous primary fragments resulting from an unplanned detonation of 100 lbs or less of HE is 670 feet for thin skin munitions. The established civilian evacuation zone is 300 meters which exceeds separation requirements. Risk to the civilian population from primary fragmentation is assessed as I-E catastrophic- improbable. Placement of makeshift barricades should restrict and limit the array of random fragments within the immediate area. Houses under construction and standing finished housed should also limit the distribution of low level fragments. Risk to operational personnel outside of the pit is assessed as I- D catastrophic - remote.

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6. SRF SAFETY RECOMMENDATION. In an effort to minimize the number of hazards to the least number of people for the least amount of time, SRF Safety recommends the following:

a. With respect to engineering controls, recommend the local exhaust ventilation system for the pit be installed.

b. With respect to protective clothing, we have considered the TEU Commander's concern with respect to potential increased risk to personnel during handling of possibly armed/fuzed munitions due to a loss of visual acuity while wearing a mask. These concerns were weighed against the fact that TEU personnel are EOD certified while wearing the protective mask. Based on this assessment we have determined that the presence of a significant risk of chemical exposure requires the use of Level C with Saranex/Tyvek suit. This level of protection is contingent upon aggressive monitoring in the pit. If monitoring indicates the area exceeds established AELs, the level of protection would have to be reassessed.

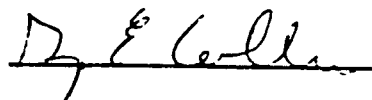
c. With respect to monitoring, recommend the RTAP be used for first entry monitoring for mustard and background real-time low-level monitoring for mustard in the pit. Additionally, the following monitoring should occur:

(1) Background low-level (bubblers) monitoring for lewisite.

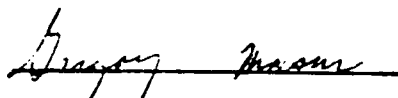
(2) Breathing zone sampling for mustard using DAAMS tubes.

(3) Continuous background sampling for phosgene in the pit.

d. With respect to work areas, recommend three work zones be developed as follows: operating pit, hot line, and public exclusion area.



George Collins  
SRF Safety



Greg Mason  
SRF Safety

	PROTECTIVE CLOTHING TYPE	INJURY POTENTIAL	
		DERMAL	RESPIRATORY
LOWEST RISK	MODIFIED LEVEL A	II-E	I-E
	LEVEL A	II-E	I-D
	LEVEL B	II-D	I-D
	LEVEL C WITH SARANEX/TYVEK SUIT	II-D	I-D
	LEVEL C	II-C	I-D
V	LEVEL D WITH SARANEX/TYVEK SUIT	II-D	I-B
HIGHEST RISK	LEVEL D	II-C	I-B

#### RISK ASSESSEMENT CODE DESCRIPTIONS

##### HAZARD SEVERITY DESCRIPTIONS:

DESCRIPTION	CATEGORY	MISHAP DEFINITION
CATASTROPHIC	I	DEATH OR SYSTEM LOSS.
CRITICAL	II	SEVERE INJURY, SEVERE OCCUPATIONAL ILLNESS, OR MAJOR SYSTEM DAMAGE.
MARGINAL	III	MINOR INJURY, MINOR OCCUPATIONAL ILLNESS, OR MINOR SYSTEM DAMAGE.
NEGLIGIBLE	IV	LESS THAN MINOR INJURY, OCCUPATIONAL ILLNESS, OR SYSTEM DAMAGE

##### HAZARD PROBABILITY DESCRIPTIONS:

DESCRIPTION	LEVEL	DEFINITION
FREQUENT	A	LIKELY TO OCCUR FREQUENTLY
PROBABLE	B	WILL OCCUR SEVERAL TIMES
OCCASIONAL	C	LIKELY TO OCCUR SOMETIME
REMOTE	D	UNLIKELY BUT POSSIBLE TO OCCUR
IMPROBABLE	E	SO UNLIKELY, IT CAN BE ASSUMED OCCURRENCE WILL NOT BE EXPERIENCED

15 January 1993

## Potential Airborne Exposure to Lewisite and Mustard During Operation Safe Removal

1. This analysis considers the potential unearthing of liquid Lewisite (L) and mustard (H) during excavation of the chemical munitions disposal pit. It compares the expected airborne vapor concentration from computer models to the accepted exposure limit of 0.003 mg/m<sup>3</sup> (both agents).
2. A matrix approach is employed using a range of potential liquid agent amounts, windspeeds, and temperatures. The expected windspeeds for Operation Safe Removal range from calm to 20 mph and the temperatures from 15-55 F. As a first cut, four different agent amounts were assumed: 1, 4, 8, and 16 fluid ounces.
3. Note: H freezes at about 58 F (14.5 C). Since its freezing temperature is greater than the expected maximum temperature, agent H would not be expected to produce any vapor challenge during excavation. However, it still presents a potential contact hazard.
4. In using the D2PC model to determine both evaporation rates and downwind dispersion of the evaporating agent, it was determined that very little liquid agent is required to produce an AEL concentration close to the source. For instance, only one fluid ounce of Lewisite (56 grams) exposed to air for five minutes at 15 F is required to produce an AEL at a downwind distance of 20 meters. Model results estimate that as little as 1/4 ounce (14 grams) produces a hazard distance to 10 m.
5. Since the 15 F temperature will likely be exceeded and larger amounts of liquid agent than 1/4 ounce may be uncovered in the pit, airborne concentrations which exceed the AEL for Lewisite could be expected for virtually all weather conditions during Operation Safe Removal.
6. This analysis assumes the purity of the agent to be 100%, probably a very conservative assumption given the age of the material. Field concentrations and hazard distances would be lower.
7. It is recommended that Tech Escort strongly consider the use of protective vapor masks during excavation of the pit to prevent potential exposure to Lewisite vapor.

  
Michael Myirski  
Hazard Analysis



**APPENDIX III**  
**CHRONOLOGY OF SAFETY IMPROVEMENTS TO THE SITE**

Chronology of Safety Improvements with Operation Safe Removal

The following is a chronology of the continual safety improvements that have been made during Operation Safe Removal through 24 Jan 93.

5 Jan -- Established Emergency Personal Decontamination Station (EPDS). The TEU arrived on site and after initial assessment established an EPDS to safely process personnel into and out of the potentially contaminated area. In support of this EPDS, the police, ambulance and city fire fighters/HAZMAT teams also arrived on-site.

-- EOD Personal Protective Clothing (PPC) Established. TEU personnel did initial assessment of the site in EOD responder ensemble (BDUs, gloves and mask slung).

6 Jan -- Upgraded PPC to Level D. TEU personnel upgraded PPC on the second day to include explosive coveralls (Level D).

7 Jan -- Upgraded PPC to Include Saranex Chemical Suit. TEU personnel upgraded PPC on the third day to include a Saranex full body chemical suit (upgraded Level D).

8 Jan -- TEU SOP Arrives On-site. TEU has SOP for Explosive Ordnance Disposal Response arrive on-site. This SOP describes responsibilities, procedures, a concept of operation, and equipment for TEU's response to reported/found unexploded ordnance, and is designed so that EOD personnel take maximum precautions to ensure safety and health.

-- CBDA Safety Representative Arrives On-site. The CBDA Safety Representative arrives on-site and begins initial safety assessment of operations. Contacts made with AMC and DA Safety on levels of protection and monitoring requirements.

11 Jan -- TEU Safety Officer Arrives On-site. Mr Sheldon Orr, TEU Safety Officer arrived on-site and began making general safety assessments of operations.

-- Upgraded PPC to Include Booties. TEU personnel added booties as a requirement to go beyond the hot line.

-- Initial Chemical Risk Assessment Completed. The initial Chemical Risk Assessment was completed 11 Jan 93. This assessment recommended an increase in monitoring given the fact that the TEU Commander selected Level D protection (mask slung).

-- PDS Expanded to Personnel Decontamination Station. In an effort to provide additional safety and comfort, a heated decon/clothing change area and full Personnel Decontamination Station (PDS) was setup.

-- SRF Surgeon Arrives On-site. The SRF Surgeon arrived on-site to provide medical support for the operations at Spring Valley.

12 Jan -- Addition of Real-Time Monitoring for Mustard. A Real Time Analysis Platform (RTAP) was positioned at the site to monitor the air and provide early warning if mustard vapor were present in the pit.

-- Addition of Monitoring for CK and Phosgene. Detection equipment for cyanogen chloride and phosgene was obtained from AEHA and positioned on-site for use, if necessary.

-- Addition of Soil Sampling in the Pit. A sampling program was initiated to take daily samples from the pit to evaluate the threat of chemical agents in the soil.

-- Addition of Approved MSDSs at the Site. Approved Material Safety Data Sheets (MSDSs) for mustard, lewisite, and phosgene arrived on-site and were provided to the TEU Safety Officer for dissemination to the workers.

13 Jan -- Addition of Breathing Zone Monitoring. As an added safety precaution, workers closest to potential sources were equipped with breathing zone (Depot Area Air Monitoring System (DAAMS)) monitoring for mustard.

-- Addition of Low Level Monitoring for Mustard and Arsenicals. Low-level monitoring (with bubblers) for mustard and total arsenicals was added to the excavation pit as a means to detect chemical agent releases above established Airborne Emission Limits (AELs).

14 Jan -- Addition of a "Heating Box". The TEU brought a heating box to the site to raise the temperature of potential chemical agent filled items. This rise in temperature would permit the certify the absence of chemical agent contamination and to establish the nature of the munition fill.

15 Jan -- Additional Monitoring of Munition Assessment Area. Low-level area monitoring for mustard began in the munition assessment tent today.

21 Jan -- Addition of the Portable Isotopic Neutron Source. The PINS arrived on site to make assessments of munitions. The PINS can detect chlorine, sulfur and nitrogen. Since most WWI chemical agents contained chlorine, this device can be use to differentiate between chemical agent fills and high explosives.

-- Additional Monitoring Equipment Arrives. As an additional measure of safety, additional detection tubes for CK, phosgene and sulfuric acid and two automatic pumps were added to the site monitoring scheme.

-- Addition of Local Exhaust Ventilation System. As an added safety measure, a local exhaust ventilation system was added to the pit. This system provides localized removal of contamination from the pit area.

22 Jan -- Established Transient Limitation. As an added safety measure, the TEU Commander established a five transient person limit beyond the PDS. This was designed to minimize casualties in the event of a mishap.

-- Eyewash Stations Brought to the Site. A portable eyewash station was set up next to the pit.

23 Jan -- Additional Eyewash Stations Brought to the Site. Portable eyewash stations were added to the munition assessment station and the packaging area.

24 Jan -- Continual Monitoring Added to the Site. As an added safety measure, continuous area monitoring for phosgene, oxygen levels and lower explosive levels began.

-- Revised Risk Assessment Completed. A revised risk assessment, considering both chemical agent and explosive safety, was completed.

-- Added Chemical/Explosive Safety Restrictions. As a result of the revised risk assessment, the TEU Commander directs the following:

-- Personnel in the munition assessment area to wear protective masks (Level C)

-- Establishment of a 5 meter overpressure hazard zone around the munition assessment area.

-- Repositioning of conex containers containing explosive rounds.

-- Sandbagging of conex containers to provide blast protection.

-- Removal of all brick material/construction debris from the site to eliminate the secondary fragmentation hazard.

**APPENDIX IV**  
**SRF COMMANDER SAFETY RULES OF ENGAGEMENT**



DEPARTMENT OF THE ARMY  
U.S. ARMY CHEMICAL AND BIOLOGICAL DEFENSE AGENCY  
ABERDEEN PROVING GROUND, MARYLAND 21010-5423



REPLY TO  
ATTENTION OF COMMANDER, OPERATION SAFE REMOVAL SERVICE RESPONSE FORCE

27 Jan 93

**MEMORANDUM FOR OPERATION SAFE REMOVAL STAFF**

**SUBJECT:** SRF at the Spring Valley Recovery Site (Operation Safe Removal), Commander's Policy (Rules of Engagement)

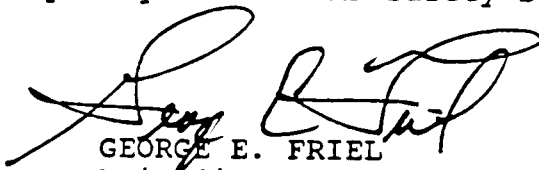
1. **CARDINAL PRINCIPLE - MINIMIZE.** The guiding principle is to minimize potential exposure by limiting the minimal number of personnel, for a minimum time, to the minimum amount of explosive or toxic chemical hazards within operational constraints. At no time will personnel or environmental safety be compromised for operational expediency. All other guidelines will be based on and adhere to this principle.
2. **ESTABLISH ZONES.** Upon arrival on site, the establishment of exclusion zones (i.e., site, hot line, and public exclusion area) based on the best available meteorological data and probable munitions involved will be the 1st priority of the initial responding unit.
3. **PRESUME THE WORST.** During all contact with any suspect munitions and or intact container, it will be assumed that the explosive and/or toxic chemical hazard is still viable until proven otherwise by accepted, proven visual identification, monitoring, or assessment procedures. All operations will be IAW Standing Operational Procedures, either oral or written, which are based on and IAW the policies and procedures taught by the Naval School, Explosive Ordnance Disposal (EOD), Indian Head, MD, appropriate T.M. 60 series publications, and/or DA FAM 385-61. Personnel protective clothing and equipment will be provided and used to ensure personnel are provided the maximum appropriate protection possible. Only EOD certified personnel will handle munitions and make the initial determination. All operational personnel will have a protective mask immediately available at all times when inside the evacuation zone.
4. **COORDINATE AND PLAN ACTIONS.** Communication will be maintained at all times between the senior EOD operator at the excavation site, TEU Commander, and the SRF Operations Officer. On-site SRF elements will coordinate among themselves and with local, state, and other federal agencies prior to taking any action which may have an adverse impact or requires their approval.

5. EXPAND MONITORING. Monitoring for suspect target chemical fills will start immediately using the best available methods. Every effort will be made to upgrade on-site monitoring techniques and equipment ASAP. Samples will be taken and transported to off-site resources (i.e., ERDEC laboratories) to verify and/or quantify monitoring data. Redundancy of resources and assessment capabilities will be established whenever practical.

6. PROVIDE MEDICAL SUPPORT. Adequate medical support will be on-site to initially evaluate, provide emergency treatment, and evacuate personnel as needed. The on-site medical officer will coordinate with local medical authorities to establish all off-site support that he deems necessary to ensure optimum care for medical emergencies and routine medical care.

7. CONTINUOUS IMPROVEMENT. Operational procedures, monitoring procedures and equipment, protective clothing, safety assessments, environmental evaluations, and medical support will be continually reviewed, scrutinized, and updated as new equipment, facts, monitoring data, or weather conditions become available. Cost will not be the determining factor in any safety related decisions.

8. The proponent for this policy is the SRF Safety Staff.



GEORGE E. FRIEL  
Brigadier General, U.S. Army  
On-Site Coordinator

**APPENDIX V**  
**LISTING OF SAFETY AND HEALTH CONCERNS ASSOCIATED**  
**WITH CHEMICALS USED AT AMERICAN UNIVERSITY**

**CHEMICALS KNOWN**  
**TO BE USED BY**  
**AMERICAN UNIVERSITY**

**PREPARED BY:    EDGEWOOD RDEC**  
**SAFETY OFFICE**  
**25 JANUARY 1993**

CODES USED AT AMERICAN UNIVERSITY AND EDGEWOOD ARSENAL

1918-1919

-----  
BV Diphenylcyanansine (DC) Br

Colorless crystals, garlic-almond odor, soluble in organic solvents, insoluble in H<sub>2</sub>O; hydrolyzes slowly; eye & nose irritation; sneezing, coughing; rapidly detoxified in the body; vomiting agent; BP: 290C; MP: 31.5C; PV: 8.8; PV: 4.7(10)<sup>-5</sup>mm @ 20C

-----  
Easance. Carbon disulfide. Br (I-4):

bp: 46°C; colorless liquid; extremely flammable; vapor/mist is irritating to eyes, mucous membranes, & upper respiratory tract; causes skin irritation.

-----  
Ethyl bromoacetate G- (US):

bp: 159°; Fp: 118°F; colorless to light yellow liquid; combustible; incompatible with acids, bases, oxidizing agents, and reducing agents; harmful if swallowed, inhaled, or absorbed through skin; causes burns; symptoms: burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea & vomiting

-----  
Ethyl chloroformate G-:

bp: 93°; Fp: 36°F; colorless liquid; flammable; vapor may travel considerable distance to source of ignition and flash back; can react with rust from corroded equipment; may be fatal if inhaled, swallowed, or absorbed through skin; causes burns; symptoms - same as above (Ethyl Bromoacetate). In case of contact, wash with copious amounts of water.

-----  
Ethyl chlorosulfonate sulvinite Br (CAS# 625-01-4)

Highly irritant and lachrymatory, fuming, oily liquid with pungent odor; emits highly toxic fumes on heating or on contact with water or acids; BP: 151-154°C; decomp 93-95°C; insoluble in water.



-----  
Ethyl dichlorocarsine G-319 (CY) (CAS# 598-14-1)

Fruity odor; liquid, soluble in organic solvents, rapidly hydrolyzed by H<sub>2</sub>O; stable in steel; attacks brass, rubber, plastics; BP: 156 C; MP: -64 C; PV: 2.09mm@ 20C; Volatility 6500 mg/m<sup>3</sup>@ 0° C; TWA: 0.2mg/m<sup>3</sup>.

-----

Ethylene chlorohydrin Hydrox Br

bp: 129°; Fp: 140°F; vapor or mist is irritating to eyes, mucous membranes, and upper respiratory tract; exposure can cause nausea, headache, vomiting, damage to liver and kidneys and readily absorbed through skin. Keep away from heat, sparks or open flame; protect from moisture.  
5ppm=16 mg/m<sup>3</sup>; ceiling 1ppm=3mg/m<sup>3</sup>

-----

Ethyl iodoacetate G-40 (MD, shipping code, SK, (KSK)

bp: 179°; Fp: 170°F; light-yellow to brown-red liquid; combustible; highly toxic; severe lachrymator; extremely destructive to tissue of mucous membranes, upper respiratory tract, eyes, skin.

-----

Ethyl iodoacetate and HGN (15) AK Br

bp: 179-180°; FP: 170°F; light-yellow to brown-red liquid; highly toxic, corrosive; combustible; severe lachrymator; causes burns; light and moisture sensitive; material is extremely destructive to tissue of mucous membranes and upper respiratory tract, eyes & skin; symptoms -- burning sensation, coughing; shortness of breath, headache, nausea.

-----

Ethyl isocyanide G-232 (CAS# 624-79-3)

Liquid, potentially explosive, polymerizes on heating at 100-160°; BP: 78-79 C.

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-----  
Ethyl isothiocyanate G214

bp: 130-132°; Fp: 90°F; colorless liquid; highly toxic; corrosive; lachrymator; keep away from heat, sparks, and open flame; flammable liquid; vapor may travel considerable distance to source of ignition and flash back; destructive to tissue of mucous membranes, upper respiratory tract, eyes, skin; may cause allergic reaction; in case of contact immediately wash with copious amounts of water for 15 min.

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Ethyl sulfide G-232

bp: 90-92°; Fp: 15°F; colorless liquid; irritant; stench; extremely flammable; forms explosive mixtures in air; vapor/mist is irritating to eyes, mucous membranes and upper respiratory tract; causes skin irritation; exposure causes nausea, headache and vomiting.

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Ethyl trichloroacetate G-283

bp: 168°; Fp: 149°F; colorless liquid; combustible liquid; corrosive; destructive to tissue of mucous membranes, upper respiratory tract, eyes, and skin; symptoms -- burning sensation, coughing, wheezing, shortness of breath, headache, nausea, vomiting.

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F code (Flaming Liquids):

F-4 phosphine  $\text{Ph}_3$  (CAS# 7803-51-2)

bp: -87.5°; PEL: 0.3ppm=0.4mg/m<sup>3</sup>; TWA=0.3ppm=0.4mg/m<sup>3</sup>; STEL=1ppm=1mg/m<sup>3</sup>; colorless gas; flammable gas; poison gas; poison by inhalation; chief effects are central nervous system, depression and lung irritation; inhalation can cause coma and convulsions leading to death in 48 hours.

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F-10 Sulfuric acid

TWA=1mg/m<sup>3</sup>; Fp-none; Viscous colorless liquid; poison, corrosive, strong oxidizer; contact with other material may cause fire, harmful if inhaled or absorbed through skin; causes burns.

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Forric chloride L-25

Black crystalline powder; corrosive; irritating dust; hygroscopic; causes severe eye irritation; destructive to tissue of mucous membranes; upper respiratory tract, eyes, & skin.

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FM Titanium tetrachloride Br (S-28, fumigerite)

bp: 277°F, MP: -13°F, vd: 6.6; colorless to light yellow liquid-vinegar like odor; poison-do not breath vapors; reactivity: vigorous, exothermic reaction with water forming corrosive fumes of hydrogen chloride.

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Formol Collians Fr

Colorless, pungent liquid (formaldehyde solution) with 10-15° methanol.

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Formol and ammonia Collongiane Fr

Mixture of formaldehyde and ammonia.

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Fumigerite Titanium tetrachloride Fr (S-28, FM) (CAS#7550-45-0)

MP: 24°; BP: 136°. Soluble in cold water, alcohol, decom by hot water; irritant to eyes and resp tract; used to produce smoke with ammonia.

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Fumite White phosphorus (in grenades) Br (I-25)

WP is a yellowish, wax-like substance; MP: 100°F; spontaneously ignites when exposed to air; fumes are toxic; intensely poisonous when taken internally.

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G Code (Gasses):

G-4      Acrolein (Papite)

bp: 53°C; Mp: -87°C; vd: 1.94; auto ignition temp 428°F;  
colorless liquid; extremely flammable; vapor may travel  
considerable distant to ignition source and flash back;  
LEL: 2.8%; UEL: 31%.

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G-7      Arsine (Yellow star, formerly)

Colorless gas; mild garlic odor; not stable in uncoated  
metal containers. Vd: 2.69; liquid density 1.34 @20°C;  
mP: -116; BP: -62.5°; vp: 11,100 @ 20°C; TWA: 0.05ppm -  
0.2mg/m3.

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G-10      Arsenic trichloride (BR marsite)

Liquid, colorless, unpleasant odor; not flammable; poisonous  
vapors; reacts with water to generate hydrogen chloride;  
corrodes metal; Boiling point 266.4°F; Freezing 9°F.

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G-13      Bromoacetone (MD<sub>5</sub> shipping code, Y<sub>2</sub> Dow Cml Co)

Colorless liquid when pure; turns violet rapidly; pungent  
odor; toxic fumes under fire conditions; combustible liquid;  
boiling point 137°C; melting point -36.5°C; flash point  
113°F 45°C.

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G-16      Xylyl bromide. (MD<sub>2</sub> shipping code, xylyl products"  
Dow Chemical Co. Code)

bp: 212-215; Lachrymator

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G-19      Chloroform

Carcinogen; colorless liquid; noncombustible toxic fumes  
emitted during fire containment; boiling point 61 C; melting  
point -63°C; vapor density 4.1; vapor pressure 160mm @ 20°C.  
TWA 2ppm=9.78mg/m3.

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G-22 Chloroacetone (tonite)

Appearance and odor - amber to black liquid; boiling point 120 C; melting point -44.5°C; specific gravity; 1.162, flash point 82 F.

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G-25 Chloropicrin (MD<sub>4</sub> shipping code, 3-1 manufacturers' code, PS, acuinite)

Shock detonation; colorless liquid with very irritating odor (if it can be smelled it may be exceeding the exposure limit); fatal if inhaled; explosive when exposed to heat, shock or friction; poison - do not breath; odor threshold 1.1 ppm; boiling point 233°F; melting point -83°F; vapor pressure: 20 mm @ 20 C; vapor density 5.7. TWA 0.1ppm= 0.7mg/m<sup>3</sup>.

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G-28 Chlorine (D-31, S-10, Red Star, borthollite)

Greenish-yellow gas; decomposition produces hydrogen chloride gas; highly toxic, corrosive; boiling point -34 C; melting point -101°C; vapor density 2.48; vapor pressure 4800 mm @ 20°C; 7000 mm @21.2°C; TWA 0.5ppm=1.5 mg/m<sup>3</sup>; STEL 0.3ppm=0.3mg/m<sup>3</sup>.

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G-31 Carbon monoxide

Toxic by inhalation; keep away from source of ignition; colorless, odorless compressed gas; flammable; vapor poisonous if inhaled; boiling point 312.7 F; no flash point. TWA 35ppm=40 mg/m<sup>3</sup>; ceiling 200ppm=229mg/m<sup>3</sup>.

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G-34 Mustard gas (MD<sub>7</sub> shipping code, MO, Edgewood Code, HS, yperite)

Vesicant; blister agent; carcinogen; damage to respiratory tract when inhaled and cause vomiting and diarrhea when absorbed. FP: 58°F.

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G-37 Methyl sulfate (Methyl hydrogen sulfate, sulfuric acid monomethyl ester) (MD<sub>6</sub> shipping code) (CAS# 75-93-4)

oil, used in sulphonations; MP < -30°C; D: 1.45-1.47 @15°C; soluble in water.

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G-40 Ethyl iodoacetate (MD<sub>1</sub> shipping code, SK, ESK)

Dense, colorless liquid; bp 179°; d 1.80; VP 0.54 mm @ 20°; VD 7.4; react with water or steam to produce toxic/corrosive fumes; when heated to decomposition or on contact with acid or acid fumes it emits highly toxic fumes.

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G-43 Hydrocyanic acid (AC, forostite)

(when in solution) Deadly poison; when heated to decomp; it emits toxic fumes of CN very dangerous storage hazard when unstablized. DOT classification - Forbidden.

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G-49 Trichloromethyl chloroformate (SF, surpalite, superpalite, pallite) (CAS# 503-38-8)

oily liquid, giving toxic, asphyxiating vapor. Used in WWI as poison gas; BP 128°C; D: 1.65 at 14°C; emits toxic/corrosive fumes on heating or contact with water.

-----  
G-52 Phosgene (MD<sub>8</sub> shipping code, L-3 manufacturers code, CG, collongite)

Colorless, poison gas/volatile liquid; odor of new mown hay or green corn; MP -118°; BP 8.3°; d: 1.37 @20°; vp 1180 mm @ 20°; vd 3.4; slightly soluble in water; very soluble in benzene and acetic acid; decomp slightly in water.

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G-55     Perchloromethylmercaptan (YH 11 Dow Chemical Co Code)  
(CAS# 594-42-3)

ACGIH TLV-TWA 0.1ppm; OSHA STD-TWA 0.1ppm; 0.76mg/m<sup>3</sup>;  
yellow liquid; highly toxic, corrosive, lachrymator, protect  
from moisture; may decompose on exposure to moist air or  
water; may be fatal if swallowed or absorbed through skin;  
BP 146-148°; PV 2.3mm (20°); FP none; VD 6.4

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G-58     Benzyl chloride (CAS# 100-44-7)

OSHA STD-AIR: TWA 1ppm=5mg/m<sup>3</sup>; ACGIH TLV: TWA 1 ppm;  
colorless liquid; may be fatal if inhaled; extremely  
destructive to tissue; carcinogen; incompatible with  
oxidizing agents, aluminum, brass and may decompose on  
exposure to moist air/water; highly toxic and corrosive;  
mutagen; combustible liquid; MP -43°; BP 177-181°; PV 10.3mm  
(60°C); FP 165°F (73°C).

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G-61     Ethyl bromoacetate (US)

Colorless to straw-colored liquid; BP 158.8°; FP <-20°;  
flash point 118°F; d: 1.514 @ 13/4°; vd 5.8; insoluble in  
water; misc in alcohol and ether.

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G-67     Cyanogen bromide (CB)

Colorless needles; MP: 52°; BP: 61.6°; D: 2.015 @ 20/4°;  
VP: 100 mm @ 22.6°; when heated to decomposition, it emits  
toxic fumes of CN and BR; possibly unstable.

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G-73     Phenylcarbylamine chloride

Pale yellow liquid, onion-like odor; bp 208-210°; insoluble  
in water; soluble in chloroform, carbon tetrachloride and  
other organics; strong irritant, lachrymator, lung injurant.

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G-76     Diphenylchloroarsine (DA) (CAS# 712-48-1)

Colorless crystals, garlic-almond odor; soluble in organic solvents; insoluble in water; eye and nose irritation; sneezing, coughing, severe headache, acute chest pain; nausea and vomiting; rapidly detoxified in body; corrosive to iron and steel; BP 290°C; MP 31°C; PV 8.8; PV 4.7(10)<sup>-5</sup>mm @ 20°C.

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G-79     Ethyl chloroformate

Colorless liquid, decomp in water; MP -80.6°; BP 94°; FP 35.6°F; D: 1.138 @ 20/4°; vd 3.74, auto ign temp 932°F; misc in alcohol, benzene, ether, chloroform; corrosive; dangerous fire hazard when exposed to flame/heat; can react vigorously with oxidizing materials; reacts with water, steam to produce toxic/corrosive fumes.

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G-85     Diiodoacetylene

Explosive; sensitive to impact, crushing, or heating to 84°C; when heated to decomposition, it emits toxic fumes of I.

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G-91     Oxalyl chloride

Colorless, fuming liquid; penetrating odor; MP -12°; BP 63-64°; D 1.488 @ 13/4°, poison, violently decomposed by water/alcohol; explodes on contact with dimethyl sulfoxide; forms shock-sensitive explosive mixtures with potassium or with K-NA alloy; will react with water/steam to produce toxic/corrosive fumes.

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G-94     Bromoacetyl bromide (CAS# 598-21-0)

Colorless liquid; harmful if swallowed, inhaled or absorbed through skin; causes burns;; inhalation may be fatal; do not allow water to enter container because of violent reaction; incompatible with strong oxidizing agents, alcohols, strong bases; BP 147-150°; PV 3.8mm (25°C); FP none.

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G-100 Thiophosgene (TP)

Reddish liquid; BP: 73.5°; D: 1.5085 @ 15°; decomp in water, alcohol; soluble in ether.

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G-103 Dichloropropyl sulfide

Ambiguous nomenclature; could be one of several compounds, range of acute from non-skin effects to highly vesicant.

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G-106 Acetyl fluoride

Bp: 20.8°C; when heated emits toxic fumes of fluoride; poison by inhalation.

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G-112 Chloroacetic anhydride

Harmful if swallowed; absorbed through skin etc; inhalation may be fatal; symptoms are burning sensation, coughing; BP: 120°C, white crystalline powder, emits toxic fumes when heated.

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G-115 Methyl selenide

Liquid; BP: -58°C; when heated emits toxic fumes of selenium.

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G-118 Cacodyl chloride (chlorodimethylarsine) (CAS# 557-89-1)

Highly toxic; flammable; BP 109°C.

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G-121 Cacodyl bromide (bromodimethylarsine) (CAS# 676-71-1)

Highly toxic yellow oil; BP: 130°C; D: 1.905 at 23°C.

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G-124    Phenyl carbylamine

Extremely destructive to mucous membranes/resp tract, eyes, etc; symptoms include coughing, wheezing, nausea, vomiting, colorless liquid; BP  $-103^{\circ}\text{C}$ .

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G-127    Methyl isocyanide

Colorless liquid with no real odor that causes tears; causes irritation of eyes, throat, nose and lungs; symptoms include irritation of eye, nose, throat, chest pain etc; BP:  $39^{\circ}\text{C}$ ; vp 348 mm @20C; TWA 0.02ppm=0.05 mg/m<sup>3</sup>.

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G-133    Titanium tetrachloride; cyanogen chloride

Titanium tetrachloride is a colorless to light yellow, fumes in moist air, when heated emits toxic fumes; highly irritating to skin, eyes, etc, emits HCl on contact with H<sub>2</sub>O; BP:  $136^{\circ}\text{F}$ . Cyanogen chloride is a colorless liquid or gas, BP:  $13.1^{\circ}\text{F}$ ; up 1010 mm at 20C; poison, highly Dangerous fumes; reacts with water to form toxic substances.

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G-139    Arsenic trifluoride

colorless liquid; BP:  $51^{\circ}\text{C}$ ; VP: 100mm @ $13^{\circ}\text{C}$ ; poison by inhalation, when heated it emits toxic fumes of fluoride and arsenic.

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G-145    Nickel carbonyl

BP  $43^{\circ}\text{C}$ ; oxidizes in air, explodes at  $60^{\circ}\text{F}$ ; carcinogen; highly toxic; colorless, volatile liquid or needles; poisonous; avoid contact with acids; emits toxic fumes; dangerous when heated.

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G-148 Sulfur trioxide (S-97)

Maybe fatal if swallowed, inhaled, or absorbed; BP: 44.7°C; extremely destructive towards tissue, eyes, skin; VP: 280mm @ 25°C; symptoms include burning, coughing, wheezing; looks like needles or polymer.

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G-151 Methyl chlorsulfonate

Colorless liquid; pungent odor; BP: 135°C; poison irritant to skin; will react with water/acids to produce toxic fumes; poison to skin, eyes, mucous membranes.

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G-154 Bromoacetone (80-84), Chlcroacetone (20-16)  
(BC, martonite)

Tear-producing compound; colorless liquid; BP: 135°C (275°F); lachrymator; vesicant.

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G-157 Diazomethane

Causes severe irritation of eyes, nose throat; yellow gas or liquid under pressure symptoms may be delayed; BP: 23°C, vapor density: 1.4; exposure may cause headache, cough, wheezing.

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G-160 Allyl isocyanide (butenenitrile) (CAS# 109-75-1)

Liquid with odor of onions; moderately toxic; emits toxic fumes when heated to decomposition; MP: -87°C; BP: 119°C; D 0.834 at 20°C.

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G-166 Trichloroacetonitrile

Harmful if swallowed, inhaled etc, extremely destructive towards tissue, inhalation may be fatal, symptoms include coughing, wheezing, burning sensation; colorless liquid; BP: 83°C; VP: 58mm @ 20°C.

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G-169 Benzoyl fluoride

Yellow liquid, BP: 159-161°; FP: 120°F; corrosive, severe lachrymator; moisture-sensitive; combustible liquid; container explosion may occur under fire conditions; extremely destructive to mucous membrane and upper resp tract, eyes & skin; causes burns.

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G-172 Benzyl bromide (Cyclite, lachrymogene)

Colorless to pale-yellow liquid; BP: 198-199°; FP: 188°F; corrosive, lachrymator; light-sensitive stench; combustible; keep away from heat and open flame; material is extremely destructive to mucous membranes and upper respiratory tract, eyes, & skin; causes burns.

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G-175 Bromomethyl ether

Bromomethyl octyl ether - colorless liquid; FP: 227°F; possible carcinogen; irritant ; lachrymator; vapor/mist irritating to eyes, mucous membranes, upper respiratory tract, skin.

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G-178 Cyanogen chloride (CC, mauguinite)

Gas, can be odorless; BP: 12.8°C; VP: 1000 mm HG @ 28°C; severe irritant and lachrymator; causes choking and slow breathing rate; rapid acting chemical agent; highly irritating to eyes & mucous membranes; will break or penetrate a protective mask canister/filter element.

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G-181 Arsenic trioxide (D-25, S-88)

AKA Arsenic(III) oxide - white powder; highly toxic; carcinogen; keep away LD50 from combustible materials; heat; sparks; open flame; may be fatal if inhaled, swallowed or absorbed through skin.

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G-184 Sodium cyanide (D-16, S-91)

White powder with chunks, VP: 1.0mm (817°C); highly toxic; severe eye irritant; hygroscopic; solution - severe eye irritant; skin irritant; becomes combustible if hydrogen cyanide gas is evolved when in contact with acids.

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G-187 Ethyl Bromoacetone, misnomer for Ethyl Bromoacetate, G-61

Colorless to light-yellow liquid; BP: 159°; FP: 118°F, VP: 2.6mm 25°C) Corrosive; lachrymator; combustible; avoid prolonged/repeated exposure; extremely destructive to mucous membranes, upper respiratory tract, eyes, & skin; causes burns.

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G-190 Methyl chloroformate

Colorless liquid; FP: 64°F; BP: 70-72°; flammable liquid; corrosive; lachrymator; highly toxic; extremely destructive to tissue of mucous membranes & upper respiratory tract, eyes and skin.

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G-193 Chloroacetonitril

Colorless liquid; BP: 124-125°; FP: 118°F; vp: 8.0mm (20°C); highly toxic; lachrymator; irritant; combustible; can react with H<sub>2</sub>O, steam, or acids releasing highly toxic fumes of hydrogen cyanide; vapor/mist irritating to eyes, mucous membranes, and upper respiratory tract.

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G-196 Chlorinated acetone and turpentine

Chloroacetone - amber to black liquid; BP: 120°; FP: 82°F; poison; corrosive; vesicant; lachrymator; light sensitive; flammable liquid; extremely destructive to mucous membranes and upper respiratory tract, eyes, and skin.

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G-199    Hydrofluoric acid

Colorless liquid, poison, corrosive; avoid prolonged/repeated exposure; extremely destructive to mucous membranes and upper respiratory tract, eyes, skin; solutions less than 2% may cause burns; will penetrate skin and attack underlying tissue/bones; VP: 776.0°mm (20°C).

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G-202    Chloromethyl ether

Chloromethyl methyl ether - colorless liquid; BP: 55-57°; VP: 260 mm 20°C), FP: 60°F; highly toxic; lachrymator; irritant; carcinogen; flammable; vapor/mist irritating to eyes, respiratory tract, mucous membranes, skin irritant.

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G-205    Acetyl cyanide

AKA pyruvonitrile; FP: 58°F; BP: 92-93°; flammable liquid.

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G-208    Mercury ethyl (ethylmercuric chloride) (CAS# 107-27-7)

MP: 192°; sublimes easily, highly toxic, causes skin burns; absorbed through skin.

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G-220    Allyl isothiocyanate

Yellow liquid, BP: 150°; FP: 115°F; highly toxic; severe lachrymator, vesicant; carcinogen; moisture-sensitive; combustible; extremely destructive to tissue of mucous membranes and upper respiratory tract, eyes and skin.

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G-226    Methyl bromoacetate

Colorless liquid, corrosive; extremely destructive to tissue of mucous membranes and upper respiratory tract; lachrymator. BP: 51-52°/15mm; FP: 145°F.

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G-229    Allyl alcohol

Colorless liquid; BP: 96-98°; FP: 72°F; highly toxic; corrosive; lachrymator; flammable liquid; extremely destructive to tissues of mucous membranes and upper respiratory tract, eyes, and skin; VP: 17.2mm (20°C).

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G-232    Ethyl isocyanide (Ethylisocyanate)

Colorless liquid; BP: 60°; VP: 13.0 mm (22.8C); FP: 20°F; highly toxic; irritant; severe lachrymator; moisture-sensitive; flammable liquid; avoid prolonged/repeated exposure; extremely destructive to mucous membranes; respiratory tract, eyes and skin.

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G-235    Dichloromethyl ether

Experimental tumorigen; when heated to composition, it emits toxic fumes of CI.

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G-238    Trichlorohydrin (2,2,2-trichloroethanol) (CAS#115-20-8)

White moist solid; incompatible with strong acids, strong oxidizing agents; strong reducing agents, acid chlorides, acid anhydrides; protect from moisture; reacts violently with strong bases; decomp products: toxic fumes of carbon monoxide, carbon dioxide, hydrogen chloride gas; MP 17.8°; BP: 151°; FP: >230°.

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G-241    Benzyl iodide (CAS# 620-05-3)

Colorless or pale yellow needles; irritant; MP: 24.5°C; BP: 93°C.

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G-244    Dichloromethyl sulfide (CAS# 3592-44-7)

Liquid; decomposes by hot water; BP: 156°C; D: 1.407 at 20°C.

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G-250 Thiophene

Clear colorless liquid; aromatic odor similar to benzene; D: 1.0573 @ 25/4°; MP: 38.3°; BP 84.4°; FP 21.2°F; VP: 40 mm @ 12.5°; VD: 2.9; insoluble in water; misc with most organic solvents; may be heated to 850° without decomposition; very dangerous fire hazard when exposed to heat/flame; explosive reaction with N-nitrosoacetanilide; violent or explosive reaction with nitric acid; incompatible with oxidizing materials.

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G-253 Acetonitrile

Colorless liquid, aromatic odor; MP: -45°; BP: 81.1°; FP 42°F; D: 0.7868 @ 20/20°; vd: 1.42; vp: 100 mm @27°; autoign temp 975°; dangerous fire hazard when exposed to heat/flame/oxidizers; explosion hazard, when heated to decomposition, it emits highly toxic fumes; potentially explosive reaction with anthanide perchlorates and nitrogen-fluorine compounds; exothermic reaction with sulfuric acid will react with water, steam, acids to produce toxic/flammable vapors; incompatible with oleum, chlorosulfonic acid, perchlorates, nitrating agents, indium, dinitrogen tetroxide, n-fluro compounds.

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G-256 Hydrogen selenide (CAS# 7783-07-5)

TWA 0.2 mg/m3

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G-259 Chloromethyl ethyl ether

FP: <-2.2°F; very dangerous fire and explosion hazard when exposed to heat/flame.

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G-262 Aluminum selenide (CAS# 1302-82-5)

Yellow-light brown color; unstable in air; decomp in water/acid.

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G-265 Dimethylarsine

Colorless liquid; bp: 36°; D: 1.213 @ 29/4°; vd: 3.65; ignites spontaneously in air; more toxic than its oxidation products; reacts vigorously with oxidizing agents; emits toxic fumes of arsine when heated to composition.

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G-268 Cacodyl

Dangerous fire hazard by spontaneous chemical reaction; ignites spontaneously in dry air; can react vigorously with oxidizing materials.

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G-271 Phenyl isothiocyanate (CAS# 103-72-0)

Colorless liquid; causes burns; lung irritation; incompatible with water; alcohol, strong bases, amines, acids, strong oxidizing agents and heat; corrosive, lachrymator; toxic; moisture sensitive; combustible; MP: 21°; BP: 221°; FP: 190°F (87°C).

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G-274 Phenylhydrazine

Yellow, monoclinic crystals or oil; mp: 19.6°; bp: 243.5°/decomp; fp: 192°F; D: 1.0978 @ 20/4°; vp: 1 mm @ 71.8°; vd: 3.7; slightly soluble in hot water; misc in alcohol, chloroform, ether, benzene; flammable when exposed to heat, flame, oxidizers, violent reaction with 2-phenylamino-3-phenyloyazirane; reacts with perchloryl fluoride to form explosive product; vigorous reaction with lead oxide; dangerous when heated.

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G-280 Benzotrichloride (trichloromethyl benzene) (CAS#98-07-7)

Liquid; toxic; irritant; MP: -5°C; BP: 220°C; D: 1.37 at 20°C.

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G-283 Ethyl trichloroacetate (CAS# 515-84-4)

Colorless liquid; incompatibility with strong bases and oxidizing agents; decomp to CO, CO<sub>2</sub> and hydrogen chloride gas; corrosive, combustible liquid; BP: 168°; FP: 149°F (65°C).

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G-286 Chlorobenzene (CAS# 108-90-7)

ACGIH TLV-TWA 75ppm; OSHA STD-AIR 75 ppm; colorless liquid; suspect carcinogen; harmful if swallowed/absorbed; incompatible with oxidizing agents; decomp to hydrogen chloride gas & CO, CO<sub>2</sub>; flammable liquid; vapor may travel to source of ignition; MP: -45°; BP: 132°; PV: 11.8mm (25°C); FP: 75°F (23°C); UEL 7.1; LEL 1.3.

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G-289 Chromyl chloride (I-55, MG)

Powerful oxidant; ignites or explodes on contact with non-metal halides, non-metal hydrides, flowers of sulfur, moist phosphorus, sodium azide, organic solvents; urea; violent reaction with water; incandescent reaction on contact with ammonia.

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G-292 Ethyl sulfide

Liquid, garlic-like odor; MP: 102°; bp: 92-93°; d: 0.837 @ 20/4°; vd: 3.22; fp: 14°F; very dangerous fire hazard when exposed to heat, flame, sparks. Can react vigorously with oxidizers; reacts with steam, acids, acid fumes to produce toxic and flammable vapors.

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G-295 Bromobenzene (CAS# 108-86-1)

Colorless liquid, irritant; incompatible with strong oxidizing agents; combustible; keep away from heat and open flame; MP: -31°; BP: 156°; PV: 4.0mm(25°C); FP: 124°F (51°C); VD: 5.41.

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G-298 Trichloroacetyl chloride

Corrosive; when heated to decomp, it emits toxic fumes of Cl.

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G-301 Phenyl isocyanate

Liquid, acrid odor; MP:  $-30^{\circ}$ ; bp:  $158-168^{\circ}$ ; d: 1.1 @  $20^{\circ}$ ; vp: 1 mm @  $10.6^{\circ}$ ; fp:  $132^{\circ}$ ; decomp in water; very soluble in ether; flammable when exposed to heat/flame; can react vigorously with oxidizing materials; will explode when stirred.

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G-307 Crotonaldehyde

Colorless liquid, flammable, vapor may travel to source of ignition to flash back; decomposition products carbon monoxide, carbon dioxide; fp:  $48^{\circ}\text{F}$ ; violent polymerization may occur at temperatures; BP:  $104^{\circ}\text{C}$ ; MP:  $-76^{\circ}\text{C}$ ; VP: 2.41; VP: 32mm @ 20 C; 145 mm @ 55 C.

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G-310 o-Chloronitrobenzene

Yellow crystalline solid; highly toxic; irritant; lower explosive limit 1.4%; upper expl limit 8.7%; BP:  $246^{\circ}\text{C}$ ; MP:  $33^{\circ}\text{C}$  to  $36^{\circ}\text{C}$ ; VD: 5.4; VP: .04 mm @  $25^{\circ}\text{C}$ ; .11 mm @  $37.7^{\circ}\text{C}$ .

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G-313 Methyldichloroarsine (G-358, peceite) (CAS# 593-89-5)

Liquid, odorless, soluble in organic solvents, slightly soluble in water; rapidly hydrolyzed and detoxified; immediate eye and nose irritation; lung injury; some skin injury; BP  $133^{\circ}\text{C}$ ; MP  $55^{\circ}\text{C}$ ; PV 5.5; volatility 74900 mg/m<sup>3</sup>; PV 2.17mm @  $20^{\circ}\text{C}$ .

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G-322 DM (Adamsite) (CAS# 578-94-9)

Vomiting agent; bright yellow crystals; highly irritant; toxic; emits highly toxic fumes when heated; used as sensory irritant; used as war gas and riot control agent; MP: 186°C; insoluble in water.

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G-325 Methyl chloroacetate

Colorless liquid; corrosive, lachrymator, toxic; lower expl limit 7.5%; upper expl limit 18.5%; BP: 130°C; MP: -33°C; VD: 3.8; VP: 5.25mm @ 20°C; 10mm @ 25°C.

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G-337 Bromobenzylcyanide (CA, canide)

White powder; teratogen, sensitizer, neurological hazard, possible mutagen, irritant; MP: 197°C to 198°C.

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G-349 Phenylldichlorcarsine (MA)

Bp: 495°F; Fp: 3.9°F; colorless to yellow liquid; weak unpleasant odor; liquid causes severe burns to eyes and skin; vapor irritates eyes; poisonous gasses are produced when heated.

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G-352 Allylamine

Bp 53°C; FP: -20°F; colorless liquid; extremely flammable; highly toxic; corrosive lachrymator; destructive to tissue of mucous membranes, upper respiratory tract, eyes and skin.

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G-355 Dichloroethyl disulfide (EA5957) (CAS# 1002-41-1)

Colorless liquid; garlic-like odor; severe skin injury; consistent with exposure to HD.

-----

---

G-361 Chloroacetophenone (Grandite)

bp: 237-247°, fp: 59°; FP: 244°; pale straw-colored liquid or white crystals, fragrant non-persistent odor; irritant; lachrymator; military poison; dangerous; when heated to decomp; emits toxic fumes, will react with water or steam to produce toxic and corrosive fumes.

---

Green star chloropicrin (65) and hydrogen sulfide  
(36) Br. shell

bp: -60.4°; colorless; flammable gas; offensive odor; irritant; asphyxiant.

---

H.A. (2,2',4,4',6,6'-hexanitrodiphenylamine)

A mixture of diphenylchloroarsine 56, ground charcoal 19 and hexanitrodiphenylamine 25 used for producing a toxic smoke; gold moist powder; incompatible with strong oxidizing agents and bases; decomp to CO, CO<sub>2</sub> and nitrogen oxides; irritant; may explode when heated (capable of a dust explosion); flammable solid; MP: 243-244°(Dec); FP: 85°F (29°C).

---

Hexachloroethane S-64

Rhombic, triclinic or cubic crystals, colorless, camphor-like odor; mp: 186.6°; D: 2.091; VP: 1mm @ 32.7; BP: 186.8°; soluble in alcohol, benzene, chloroform, ether, oils; insoluble in water; slightly explosive by spontaneous chemical reaction; dehalogenation by reaction with alkalies, metals, etc., will produce spontaneous explosive chloracetylenes. When heated to decomposition, it emits highly toxic fumes of CI and phosgene.

---

Hillite Magnesium carbonate leves and capsaicin Br

Solid, irritant, ingredient in commercial CS products.

---

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### Homoartonite

A substance similar to "bromketone" but containing a small proportion of chloro derivatives; it is made by treating methyl ethyl keton (2-butanone) with bromide, sodium chlorate and sulfuric acid. It is a lachrymator comparable with martonite.

---

### Hoolamite.

A carbon monoxide absorbent.

---

### Hoolamite I

consists of granulated pumice impregnated with iodine pontoxide and 28% oleum. Hoolamite II is a mixture of about two-thirds hoolamite I and one-third more active material (richer oleum and treated with a small amount of iodine). The code name for hoolamite is A-49 or HL

---

### Hopcalite.

A carbon monoxide absorbent consisting of specially prepared magnesium dioxide and one or more of several other oxides. Hopcalite I, the first preparation actually used, contains cobaltic oxide, copper oxide and a small amount of silver oxide. Code, HC.

---

### Hopkinsite.

A variety of hopcalito. Hopkinsite I contains, in addition to magnesium dioxide, silver oxide or carbonate; in hopkinsite II, cupric oxide partially replaces the silver; in hopkinsite III the silver is entirely replaced by cupric oxide. Hopkinsite is also called frazarite

---

DATA FOR THE FOLLOWING CHEMICALS  
KNOWN TO BE USED AT AMERICAN UNIVERSITY  
IS UNAVAILABLE AT THIS TIME

-----  
Ethyl dibromoacetate G- (CAS# 617-33-4)  
-----

F-7 diphosphine  $P_2H_4$  (CAS# 13445-50-6)  
-----

Flash Mixture I-7  
-----

Fraissite An aromatic hydrocarbon B 150-200<sub>o</sub> and benzyl iodide  
D<sub>20</sub> 1.142 Fr  
-----

Frazerite Hopkinsite  
-----

Forestite Hydrocyanic acid -- According to one document a  
mixture of ECN and chloroform but this is not official).  
(G-43), AC)  
-----

G-46 chloromethyl chloroformate (cipalite, palite)  
(CAS# 2212-8-62-7)  
-----

G-64 Ethyl dichloroacetate  
-----

G-70 "Bromacetone" (G-136)  
-----

G-82 Isoallylamine (CAS# 43691-072 and 4427-28-5)  
-----

G-97 Methylnitrosourethane (N-Nitroso-n-methylurethane)  
(CAS# 615-53-2)  
-----

G-109 chloroacetyl fluoride (CAS# 359-14-8)  
-----

G-130 tolyl isocyanides (mixed) (CAS# 10468-64-1 ortho;  
20600-54-8 meta; 7175-47-5 para; 28064-79-1 unspec)  
-----

-----  
G-136 "Bromacetone" (G-70)  
-----  
G-142 Trichloroacetyl cyanide (CAS# 14752-58-0)  
-----  
G-163 Chlorinated carbon disulfide  
-----  
G-185  
-----  
G-186  
-----  
G-211 Cacodyl cyanide (CC in some C.C.P. reports)  
-----  
G-217 Phenylcarbylamine (unofficial)  
-----  
G-247 Tetrachloromethyl sulfide (CAS# 1454-96-2 & 51174-93-7)  
-----  
G-316 o-Tolyl isocyanide  
-----  
G-319 Ethyldchloroarsine (CY)  
-----  
G-328 Acetyl thiocyanate (CAS# 69626-81-9)  
-----  
G-334 Cadmium methyl  
-----  
G-340 Chlorodiethyl sulfide  
-----  
G-343 "Bromxylyl cyanide"  
-----  
G-346 Kendallite, RCN, HCL  
-----  
G-358 Methyldichlorarsine (G-313)  
-----  
Grandite Chloroacetophenone Fr  
-----



-----  
Halo wax S-61  
-----

HC Hopcalite  
-----

HL Hoolamite (A-49)  
-----

Blank

APPENDIX VI  
INTERIM HAZARD CLASSIFICATIONS FOR TRANSPORTATION



DEPARTMENT OF THE ARMY  
U.S. ARMY EDGEWOOD RESEARCH, DEVELOPMENT AND ENGINEERING CENTER  
ABERDEEN PROVING GROUND, MARYLAND 21010-5423



REPLY TO  
ATTENTION OF

13 JAN 1993

SCBRD-ODR-S (385-16a)

MEMORANDUM FOR Commander, U.S. Army Technical Escort Unit,  
ATTN: SMCTE-CO, Aberdeen Proving Ground,  
MD 21010-5423

SUBJECT: Interim Hazard Classification (ERDEC No. 93-06) for  
75 millimeter, Chemical Projectile

1. The following interim hazard classification has been issued  
for the subject item:

- |  |  |
|--|--|
| a. DOD Hazard Class/Div/SCG:                     | 1.2K   |
| b. DOT Hazard Class:                             | 1.2K   |
| c. DOT Label:                                    | Explosive 1.2K, Poison                       |
| d. UN Serial Number:                             | 0020   |
| e. DOT/UN Proper Shipping Name:                  | AMMUNITION, TOXIC                            |
| f. DOT Container Marking:                        | AMMUNITION, TOXIC<br>UN 0020<br>PN 1360-SV-1 |
| g. Net Explosive Weight:                         | 0.03545 kg<br>(0.0782 pounds)                |
| h. Net Propellant/Pyrotechnic<br>Weight:         | 0.0  |
| i. Net Explosive Weight for QD<br>Determination: | 0.03545 kg<br>(0.0782 pounds)                |

2. Subject item must be packaged in accordance with 49 CFR  
173.62, packing method E-102 (Docket No HM 181A, dated 21 Dec  
90).

3. The above interim hazard classification is valid until 13  
March 1993 or until you obtain a final hazard classification,  
whichever occurs first.

SCBRD-ODR-S

SUBJECT: Interim Hazard Classification (ERDEC No. 93-06) for  
75 millimeter, Chemical Projectile

4. The above hazard classification has been issued in accordance with the procedures of TB 700-2 and authorized by 49 CFR 173.56(b)(2)(i). Each motor vehicle used to transport the above item must carry a copy of this hazard classification.



MANUEL LOPEZ  
Safety Manager

CF:

Chairman, DOD Explosives Safety Board, ATTN: DDESB-KT, Hoffman  
Bldg 1, 2461 Eisenhower Avenue, Alexandria, VA 22331-0600  
Director, U.S. Army Technical Center for Explosives Safety,  
ATTN: SMCAC-EST, Savanna, IL 61074-9639



DEPARTMENT OF THE ARMY

U.S. ARMY EDGEWOOD RESEARCH, DEVELOPMENT AND ENGINEERING CENTER  
ABERDEEN PROVING GROUND, MARYLAND 21010-5423



REPLY TO  
ATTENTION OF

SCBRD-ODR-S (385-16a)

13 JAN 1993

MEMORANDUM FOR Commander, U.S. Army Technical Escort Unit,  
ATTN: SMCTE-CO, Aberdeen Proving Ground,  
MD 21010-5423

SUBJECT: Interim Hazard Classification (ERDEC No. 93-07) for  
Livens Chemical Projectile

1. The following interim hazard classification has been issued  
for the subject item:

- a. DOD Hazard Class/Div/SCG: 1.2K
- b. DOT Hazard Class: 1.2K
- c. DOT Label: Explosive 1.2K, Poison
- d. UN Serial Number: 0020
- e. DOT/UN Proper Shipping Name: AMMUNITION, TOXIC
- f. DOT Container Marking: AMMUNITION, TOXIC  
UN 0020  
PN 1360-SV-2
- g. Net Explosive Weight: 0.095 kg  
(0.2094 pounds)
- h. Net Propellant/Pyrotechnic  
Weight: 0.0
- i. Net Explosive Weight for QD  
Determination: 0.095 kg  
(0.2094 pounds)

2. Subject item must be packaged in accordance with 49 CFR  
173.62, packing method E-102 (Docket No HM 181A, dated 21 Dec  
90).

3. The above interim hazard classification is valid until 13  
March 1993 or until you obtain a final hazard classification,  
whichever occurs first.

SCBRD-ODR-5

SUBJECT: Interim Hazard Classification (ERDEC No. 93-07) for  
Livens Chemical Projectile

4. The above hazard classification has been issued in accordance with the procedures of TB 700-2 and authorized by 49 CFR 173.56(b)(2)(i). Each motor vehicle used to transport the above item must carry a copy of this hazard classification.



MANUEL LOPEZ  
Safety Manager

CF:

Chairman, DOD Explosives Safety Board, ATTN: DDESB-KT, Hoffman  
Bldg 1, 2461 Eisenhower Avenue, Alexandria, VA 22331-0600  
Director, U.S. Army Technical Center for Explosives Safety,  
ATTN: SMCAC-EST, Savanna, IL 61074-9639



DEPARTMENT OF THE ARMY  
U.S. ARMY EDGEWOOD RESEARCH, DEVELOPMENT AND ENGINEERING CENTER  
ABERDEEN PROVING GROUND, MARYLAND 21010-5423



REPLY TO  
ATTENTION OF

SCBRD-ODR-S (385-16a)

13 JAN 1993

MEMORANDUM FOR Commander, U.S. Army Technical Escort Unit,  
ATTN: SMCTE-CO, Aberdeen Proving Ground,  
MD 21010-5423

SUBJECT: Interim Hazard Classification (ERDEC No. 93-08) for  
4.7 Inch, Gun Projectile, Chemical

1. The following interim hazard classification has been issued  
for the subject item:

- a. DOD Hazard Class/Div/SCG: 1.2K
- b. DOT Hazard Class: 1.2K
- c. DOT Label: Explosive 1.2K, Poison
- d. UN Serial Number: 0020
- e. DOT/UN Proper Shipping Name: AMMUNITION, TOXIC
- f. DOT Container Marking: AMMUNITION, TOXIC  
UN 0020  
PN 1360-SV-3
- g. Net Explosive Weight: 0.10 kg  
(0.2205 pounds)
- h. Net Propellant/Pyrotechnic  
Weight: 0.0
- i. Net Explosive Weight for QD  
Determination: 0.10 kg  
(0.2205 pounds)

2. Subject item must be packaged in accordance with 49 CFR  
173.62, packing method E-102 (Docket No HM 181A, dated 21 Dec  
90).

3. The above interim hazard classification is valid until 13  
March 1993 or until you obtain a final hazard classification,  
whichever occurs first.

SCBRD-ODR-S

SUBJECT: Interim Hazard Classification (ERDEC No. 93-08) for  
4.7 Inch, Gun Projectile, Chemical

4. The above hazard classification has been issued in accordance with the procedures of TB 700-2 and authorized by 49 CFR 173.56(b)(2)(i). Each motor vehicle used to transport the above item must carry a copy of this hazard classification.



MANUEL LOPEZ  
Safety Manager

CF:

Chairman, DOD Explosives Safety Board, ATTN: DDESB-KT, Hoffman  
Bldg 1, 2461 Eisenhower Avenue, Alexandria, VA 22331-0600  
Director, U.S. Army Technical Center for Explosives Safety,  
ATTN: SMCAC-EST, Savanna, IL 61074-9639





DEPARTMENT OF THE ARMY  
U.S. ARMY EDGEWOOD RESEARCH, DEVELOPMENT AND ENGINEERING CENTER  
ABERDEEN PROVING GROUND, MARYLAND 21010-5423



REPLY TO  
ATTENTION OF

SCBRD-ODR-S (385-16a)

14 JAN 1993

MEMORANDUM FOR Commander, U.S. Army Technical Escort Unit,  
ATTN: SMCTE-CO, Aberdeen Proving Ground,  
MD 21010-5423

SUBJECT: Interim Hazard Classification (ERDEC No. 93-09) for  
3.0 Inch, Stokes Trench Mortar, HE, Projectile

1. The following interim hazard classification has been issued  
for the subject item:

- a. DOD Hazard Class/Div/SCG: 1.1F
- b. DOT Hazard Class: 1.1F
- c. DOT Label: Explosive 1.1F
- d. UN Serial Number: 0167
- e. DOT/UN Proper Shipping Name: PROJECTILES
- f. DOT Container Marking: PROJECTILES  
UN 0167  
PN 1315-SV-A
- g. Net Explosive Weight: 1.134 kg  
(2.50 pounds)
- h. Net Propellant/Pyrotechnic  
Weight: 0.0
- i. Net Explosive Weight for QD  
Determination: 1.134 kg  
(2.50 pounds)

2. Subject item must be packaged in accordance with 49 CFR  
173.62, packing method E-106 (Docket No HM 181A, dated 21 Dec  
90).

3. The above interim hazard classification is valid until 13  
March 1993 or until you obtain a final hazard classification,  
whichever occurs first.

SCBRD-ODR-S

SUBJECT: Interim Hazard Classification (ERDEC No. 93-09) for  
3.0 Inch, Stokes Trench Mortar, HE, Projectile

4. The above hazard classification has been issued in accordance with the procedures of TB 700-2 and authorized by 49 CFR 173.56(b)(2)(i). Each motor vehicle used to transport the above item must carry a copy of this hazard classification.



MANUEL LOPEZ  
Safety Manager

CF:

Chairman, DOD Explosives Safety Board, ATTN: DDESB-KT, Hoffman  
Bldg 1, 2461 Eisenhower Avenue, Alexandria, VA 22331-0600  
Director, U.S. Army Technical Center for Explosives Safety,  
ATTN: SMCAC-EST, Savanna, IL 61074-9639



DEPARTMENT OF THE ARMY  
U.S. ARMY EDGEWOOD RESEARCH, DEVELOPMENT AND ENGINEERING CENTER  
ABERDEEN PROVING GROUND, MARYLAND 21010-5423



REPLY TO  
ATTENTION OF

SCBRD+ODR-S (385-16a)

14 JAN 1993

MEMORANDUM FOR Commander, U.S. Army Technical Escort Unit,  
ATTN: SMCTE-CO, Aberdeen Proving Ground,  
MD 21010-5423

SUBJECT: Interim Hazard Classification (ERDEC No. 93-10) for  
3.0 Inch, Stokes Trench Mortar, Smoke Projectile

1. The following interim hazard classification has been issued  
for the subject item:

- a. DOD Hazard Class/Div/SCG: 1.2H
- b. DOT Hazard Class: 1.2H
- c. DOT Label: Explosive 1.2H
- d. UN Serial Number: 0245
- e. DOT/UN Proper Shipping Name: AMMUNITION, SMOKE,  
WHITE PHOSPHORUS
- f. DOT Container Marking: AMMUNITION, SMOKE,  
WHITE PHOSPHORUS  
UN 0245  
PN 1315-SV-B
- g. Net Explosive Weight: 1.234 kg  
(2.72 pounds)
- h. Net Propellant/Pyrotechnic  
Weight: 0.0
- i. Net Explosive Weight for QD  
Determination: 1.234 kg  
(2.72 pounds)

2. Subject item must be packaged in accordance with 49 CFR  
173.62, packing method E-102 (Docket No HM 181A, dated 21 Dec  
90).

3. The above interim hazard classification is valid until 13  
March 1993 or until you obtain a final hazard classification,  
whichever occurs first.

SCBRD-ODR-S

SUBJECT: Interim Hazard Classification (ERDEC No. 93-10) for  
3.0 Inch, Stokes Trench Mortar, Smoke Projectile

4. The above hazard classification has been issued in accordance with the procedures of TB 700-2 and authorized by 49 CFR 173.56(b)(2)(i). Each motor vehicle used to transport the above item must carry a copy of this hazard classification.



MANUEL LOPEZ  
Safety Manager

CF:

Chairman, DOD Explosives Safety Board, ATTN: DDESB-KT, Hoffman  
Bldg 1, 2461 Eisenhower Avenue, Alexandria, VA 22331-0600  
Director, U.S. Army Technical Center for Explosives Safety,  
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DEPARTMENT OF THE ARMY

U.S. ARMY EDGEWOOD RESEARCH, DEVELOPMENT AND ENGINEERING CENTER  
ABERDEEN PROVING GROUND, MARYLAND 21010-5423



REPLY TO  
ATTENTION OF

SCBRD-ODR-S (385-16a)

14 JAN 1993

MEMORANDUM FOR Commander, U.S. Army Technical Escort Unit,  
ATTN: SMCTE-CO, Aberdeen Proving Ground,  
MD 21010-5423

SUBJECT: Interim Hazard Classification (ERDEC No. 93-11) for  
75 millimeter, MK III, HE, Projectile

1. The following interim hazard classification has been issued  
for the subject item:

- |  |  |
|--|--|
| a. DOD Hazard Class/Div/SCG:                     | 1.1F                                   |
| b. DOT Hazard Class:                             | 1.1F                                   |
| c. DOT Label:                                    | Explosive 1.1F                         |
| d. UN Serial Number:                             | 0167                                   |
| e. DOT/UN Proper Shipping Name:                  | PROJECTILES                            |
| f. DOT Container Marking:                        | PROJECTILES<br>UN 0167<br>PN 1315-SV-C |
| g. Net Explosive Weight:                         | 0.753 kg<br>(1.66 pounds)              |
| h. Net Propellant/Pyrotechnic<br>Weight:         | 0.0                                    |
| i. Net Explosive Weight for QD<br>Determination: | 0.753 kg<br>(1.66 pounds)              |

2. Subject item must be packaged in accordance with 49 CFR  
173.62, packing method E-106 (Docket No HM 181A, dated 21 Dec  
90).

3. The above interim hazard classification is valid until 13  
March 1993 or until you obtain a final hazard classification,  
whichever occurs first.

SCBRD-ODR-S

SUBJECT: Interim Hazard Classification (ERDEC No. 93-11) for  
75 millimeter, MK III, HE, Projectile

4. The above hazard classification has been issued in accordance with the procedures of TB 700-2 and authorized by 49 CFR 173.56(b)(2)(i). Each motor vehicle used to transport the above item must carry a copy of this hazard classification.



MANUEL LOPEZ  
Safety Manager

CF:

Chairman, DOD Explosives Safety Board, ATTN: DDESB-KT, Hoffman  
Bldg 1, 2461 Eisenhower Avenue, Alexandria, VA 22331-0600  
Director, U.S. Army Technical Center for Explosives Safety,  
ATTN: SMCAC-EST, Savanna, IL 61074-9639



DEPARTMENT OF THE ARMY  
U.S. ARMY EDGEWOOD RESEARCH, DEVELOPMENT AND ENGINEERING CENTER  
ABERDEEN PROVING GROUND, MARYLAND 21010-5423



REPLY TO  
ATTENTION OF

SCBRD-ODR-S (385-16a)

25 JAN 1993

MEMORANDUM FOR Commander, U.S. Army Technical Escort Unit,  
ATTN: SMCTE-CO, Aberdeen Proving Ground,  
MD 21010-5423

SUBJECT: Interim Hazard Classification (ERDEC No. 93-12) for  
White Phosphorus Igniter

1. The following interim hazard classification has been issued  
for the subject item:

- a. DOD Hazard Class/Div/SCG: 1.2H
- b. DOT Hazard Class: 1.2H
- c. DOT Label: Explosive 1.2H
- d. UN Serial Number: 0245
- e. DOT/UN Proper Shipping Name: AMMUNITION, SMOKE,  
WHITE PHOSPHORUS
- f. DOT Container Marking: AMMUNITION, SMOKE,  
WHITE PHOSPHORUS  
UN 0245  
PN 1315-SV-D
- g. Net Explosive Weight: 0.504 kg  
(1.11 pounds)
- h. Net Propellant/Pyrotechnic  
Weight: 0.0
- i. Net Explosive Weight for QD  
Determination: 0.504 kg  
(1.11 pounds)


2. Subject item must be packaged in accordance with 49 CFR  
173.62, packing method E-102 (Docket No HM 181A, dated 21 Dec  
90).

3. The above interim hazard classification is valid until 13  
March 1993 or until you obtain a final hazard classification,  
whichever occurs first.

SCBRD-ODR-5

SUBJECT: Interim Hazard Classification (ERDEC No. 93-12) for  
White Phosphorus Grenade

4. The above hazard classification has been issued in accordance with the procedures of TB 700-2 and authorized by 49 CFR 173.56(b)(2)(i). Each motor vehicle used to transport the above item must carry a copy of this hazard classification.

  
CAROL A. EASON  
Safety Engineer

CF:

Chairman, DOD Explosives Safety Board, ATTN: DDESB-KT, Hoffman  
Bldg 1, 2461 Eisenhower Avenue, Alexandria, VA 22331-0600  
Director, U.S. Army Technical Center for Explosives Safety,  
ATTN: SMCAC-EST, Savanna, IL 61074-9639





DEPARTMENT OF THE ARMY  
U.S. ARMY EDGEWOOD RESEARCH, DEVELOPMENT AND ENGINEERING CENTER  
ABERDEEN PROVING GROUND, MARYLAND 21010-5423



REPLY TO  
ATTENTION OF

25 JAN 1993

SCBRD-ODR-S (385-16a)

MEMORANDUM FOR Commander, U.S. Army Technical Escort Unit,  
ATTN: SMCTE-CO, Aberdeen Proving Ground,  
MD 21010-5423

SUBJECT: Interim Hazard Classification (ERDEC No. 93-14) for  
75 millimeter, Common Shrapnel, MK I

1. The following interim hazard classification has been issued  
for the subject item:

- |  |  |
|--|--|
| a. DOD Hazard Class/Div/SCG:                     | 1.1F                                   |
| b. DOT Hazard Class:                             | 1.1F                                   |
| c. DOT Label:                                    | Explosive 1.1F                         |
| d. UN Serial Number:                             | 0167                                   |
| e. DOT/UN Proper Shipping Name:                  | PROJECTILES                            |
| f. DOT Container Marking:                        | PROJECTILES<br>UN 0167<br>PN 1315-SV-E |
| g. Net Explosive Weight:                         | 0.082 kg<br>(0.18 pounds)              |
| h. Net Propellant/Pyrotechnic<br>Weight:         | 0.0                                    |
| i. Net Explosive Weight for QD<br>Determination: | 0.082 kg<br>(0.18 pounds)              |

2. Subject item must be packaged in accordance with 49 CFR  
173.62, packing method E-106 (Docket No HM 181A, dated 21 Dec  
90).

3. The above interim hazard classification is valid until 13  
March 1993 or until you obtain a final hazard classification,  
whichever occurs first.

SCBRD-ODR-S

SUBJECT: Interim Hazard Classification (ERDEC No. 93-14) for  
75 millimeter, Common Shrapnel, MK I

4. The above hazard classification has been issued in accordance with the procedures of TB 700-2 and authorized by 49 CFR 173.56(b)(2)(i). Each motor vehicle used to transport the above item must carry a copy of this hazard classification.

  
CAROL A. EASON  
Safety Engineer

CF:

Chairman, DOD Explosives Safety Board, ATTN: DDESB-KT, Hoffman  
Bldg 1, 2461 Eisenhower Avenue, Alexandria, VA 22331-0600  
Director, U.S. Army Technical Center for Explosives Safety,  
ATTN: SMCAC-EST, Savanna, IL 61074-9639



DEPARTMENT OF THE ARMY  
U.S. ARMY EDGEWOOD RESEARCH, DEVELOPMENT AND ENGINEERING CENTER  
ABERDEEN PROVING GROUND, MARYLAND 21010-5423



REPLY TO  
ATTENTION OF

SCBRD-ODR-S (385-16a)

25 JAN 1993

MEMORANDUM FOR Commander, U.S. Army Technical Escort Unit,  
ATTN: SMCTE-CO, Aberdeen Proving Ground,  
MD 21010-5423

SUBJECT: Interim Hazard Classification (ERDEC No. 93-15) for  
75 millimeter, Common Steel Shell, MK I (Incendiary)

1. The following interim hazard classification has been issued  
for the subject item:

- |   |  |
|---|--|
| a. DOD Hazard Class/Div/SCG:                  | 1.1F                                   |
| b. DOT Hazard Class:                          | 1.1F                                   |
| c. DOT Label:                                 | Explosive 1.1F                         |
| d. UN Serial Number:                          | 0167                                   |
| e. DOT/UN Proper Shipping Name:               | PROJECTILES                            |
| f. DOT Container Marking:                     | PROJECTILES<br>UN 0167<br>PN 1315-SV-F |
| g. Net Explosive Weight:                      | 0.454 kg<br>(1.00 pounds)              |
| h. Net Propellant/Pyrotechnic Weight:         | 0.0                                    |
| i. Net Explosive Weight for QD Determination: | 0.454 kg<br>(1.00 pounds)              |

2. Subject item must be packaged in accordance with 49 CFR 173.62, packing method E-106 (Docket No HM 181A, dated 21 Dec 90).

3. The above interim hazard classification is valid until 13 March 1993 or until you obtain a final hazard classification, whichever occurs first.

SCBRD-ODR-8

SUBJECT: Interim Hazard Classification (ERDEC No. 93-15) for  
75 millimeter, Common Steel Shell, MK I (Incendiary)

4. The above hazard classification has been issued in accordance with the procedures of TB 700-2 and authorized by 49 CFR 173.56(b)(2)(i). Each motor vehicle used to transport the above item must carry a copy of this hazard classification.



CAROL A. EASON  
Safety Engineer

CF:  
Chairman, DOD Explosives Safety Board, ATTN: DDESB-KT, Hoffman  
Bldg 1, 2461 Eisenhower Avenue, Alexandria, VA 22331-0600  
Director, U.S. Army Technical Center for Explosives Safety,  
ATTN: SMCAC-EST, Savanna, IL 61074-9639



DEPARTMENT OF THE ARMY

U.S. ARMY EDGEWOOD RESEARCH, DEVELOPMENT AND ENGINEERING CENTER  
ABERDEEN PROVING GROUND, MARYLAND 21010-5423



REPLY TO  
ATTENTION OF

25 JAN 1993

SCBRD-ODR-S (385-16a)

MEMORANDUM FOR Commander, U.S. Army Technical Escort Unit,  
ATTN: SMCTE-CO, Aberdeen Proving Ground,  
MD 21010-5423

SUBJECT: Interim Hazard Classification (ERDEC No. 93-16) for  
3 Inch Stokes, Trench Burning, Smoke, Projectile

1. The following interim hazard classification has been issued  
for the subject item:

a. DOD Hazard class/Div/SCG:	1.1G
b. DOT Hazard Class:	1.1G
c. DOT Label:	Explosive 1.1G
d. UN Serial Number:	0428
e. DOT/UN Proper Shipping Name:	ARTICLES, PYROTECHNIC
f. DOT Container Marking:	ARTICLES, PYROTECHNIC UN 0428 PN 1315-SV-G
g. Net Explosive Weight:	1.814 kg (4.00 pounds)
h. Net Propellant/Pyrotechnic Weight:	0.0
i. Net Explosive Weight for QD Determination:	1.814 kg (4.00 pounds)


2. Subject item must be packaged in accordance with 49 CFR  
173.62, packing method E-109 (Docket No HM 181A, dated 21 Dec  
90).

3. The above interim hazard classification is valid until 13  
March 1993 or until you obtain a final hazard classification,  
whichever occurs first.

SCBRD-ODR-S

SUBJECT: Interim Hazard Classification (ERDEC No. 93-16) for  
3 Inch Stokes, Trench Burning, Smoke, Projectile

4. The above hazard classification has been issued in accordance with the procedures of TB 700-2 and authorized by 49 CFR 173.56(b)(2)(i). Each motor vehicle used to transport the above item must carry a copy of this hazard classification.

  
CAROL A. EASON  
Safety Engineer

CF:

Chairman, DOD Explosives Safety Board, ATTN: DDESB-KT, Hoffman  
Bldg 1, 2461 Eisenhower Avenue, Alexandria, VA 22331-0600  
Director, U.S. Army Technical Center for Explosives Safety,  
ATTN: SMCAC-EST, Savanna, IL 61074-9639



DEPARTMENT OF THE ARMY  
U.S. ARMY EDGEWOOD RESEARCH DEVELOPMENT AND ENGINEERING CENTER  
ABERDEEN PROVING GROUND, MARYLAND 21010-5423



REPLY TO  
ATTENTION OF

SCBRD-ODR-S (385-16a)

25 JAN 1993

MEMORANDUM FOR Commander, U.S. Army Technical Escort Unit,  
ATTN: SMCTE-CO, Aberdeen Proving Ground,  
MD 21010-5423

SUBJECT: Interim Hazard Classification (ERDEC No. 93-17) for  
3 Inch Steel Shell, HE

1. The following interim hazard classification has been issued  
for the subject item:

- a. DOD Hazard Class/Div/SCG: 1.1F
- b. DOT Hazard Class: 1.1F
- c. DOT Label: Explosive 1.1F
- d. UN Serial Number: 0167
- e. DOT/UN Proper Shipping Name: PROJECTILES
- f. DOT Container Marking: PROJECTILES  
UN 0167  
PN 1315-SV-H
- g. Net Explosive Weight: 0.372 kg  
(0.82 pounds)
- h. Net Propellant/Pyrotechnic  
Weight: 0.0
- i. Net Explosive Weight for QD  
Determination: 0.372 kg  
(0.82 pounds)


2. Subject item must be packaged in accordance with 49 CFR  
173.62, packing method E-106 (Docket No HM 181A, dated 21 Dec  
90).

3. The above interim hazard classification is valid until 13  
March 1993 or until you obtain a final hazard classification,  
whichever occurs first.

SCBRD-ODR-S

SUBJECT: Interim Hazard Classification (ERDEC No. 93-17) for  
3 Inch Steel Shell, HE

4. The above hazard classification has been issued in accordance with the procedures of TB 700-2 and authorized by 49 CFR 173.56(b)(2)(i). Each motor vehicle used to transport the above item must carry a copy of this hazard classification.

  
CAROL A. EASON  
Safety Engineer

CF:

Chairman, DOD Explosives Safety Board, ATTN: DDESB-KT, Hoffman  
Bldg 1, 2461 Eisenhower Avenue, Alexandria, VA 22331-0600  
Director, U.S. Army Technical Center for Explosives Safety,  
ATTN: SMCAC-EST, Savanna, IL 61074-9639





DEPARTMENT OF THE ARMY

U.S. ARMY EDGEWOOD RESEARCH, DEVELOPMENT AND ENGINEERING CENTER  
ABERDEEN PROVING GROUND, MARYLAND 21010-5423



REPLY TO  
ATTENTION OF

SCBRD-ODR-S (385-16a)

25 JAN 1993

MEMORANDUM FOR Commander, U.S. Army Technical Escort Unit,  
ATTN: SMCTE-CO, Aberdeen Proving Ground,  
MD 21010-5423

SUBJECT: Interim Hazard Classification (ERDEC No. 93-18) for  
75 millimeter, Experimental Smoke, Projectile

1. The following interim hazard classification has been issued  
for the subject item:

- a. DOD Hazard Class/Div/SCG: 1.2G
- b. DOT Hazard Class: 1.2G
- c. DOT Label: Explosive 1.2G,  
Corrosive
- d. UN Serial Number: 0015
- e. DOT/UN Proper Shipping Name: AMMUNITION, SMOKE
- f. DOT Container Marking: AMMUNITION, SMOKE  
UN 0015  
PN 1360-SV-4
- g. Net Explosive Weight: 0.091 kg  
(0.20 pounds)
- h. Net Propellant/Pyrotechnic  
Weight: 0.0
- i. Net Explosive Weight for QD  
Determination: 0.091 kg  
(0.20 pounds)

2. Subject item must be packaged in accordance with 49 CFR  
173.62, packing method E-102 (Docket No HM 181A, dated 21 Dec  
90).

3. The above interim hazard classification is valid until 13  
March 1993 or until you obtain a final hazard classification,  
whichever occurs first.

SCBRD-ODR-S

SUBJECT: Interim Hazard Classification (ERDEC No. 93-18) for  
75 millimeter, Experimental Smoke, Projectile

4. The above hazard classification has been issued in accordance with the procedures of TB 700-2 and authorized by 49 CFR 173.56(b)(2)(i). Each motor vehicle used to transport the above item must carry a copy of this hazard classification.

  
CAROL A. EASON  
Safety Engineer

CF:

Chairman, DOD Explosives Safety Board, ATTN: DDESB-KT, Hoffman  
Bldg 1, 2461 Eisenhower Avenue, Alexandria, VA 22331-0600  
Director, U.S. Army Technical Center for Explosives Safety,  
ATTN: SMCAC-EST, Savanna, IL 61074-9639



DEPARTMENT OF THE ARMY  
U.S. ARMY EDGEWOOD RESEARCH, DEVELOPMENT AND ENGINEERING CENTER  
ABERDEEN PROVING GROUND, MARYLAND 21010-5423



REPLY TO  
ATTENTION OF

25 JAN 1993

SCBRD-ODR-S (385-16a)

MEMORANDUM FOR Commander, U.S. Army Technical Escort Unit,  
ATTN: SMCTE-CO, Aberdeen Proving Ground,  
MD 21010-5423

SUBJECT: Interim Hazard Classification (ERDEC No. 93-19) for  
75 millimeter, Common Steel Shell, MK I

1. The following interim hazard classification has been issued  
for the subject item:

- |  |  |
|--|--|
| a. DOD Hazard Class/Div/SCG:                     | 1.2G   |
| b. DOT Hazard Class:                             | 1.2G   |
| c. DOT Label:                                    | Explosive 1.2G   |
| d. UN Serial Number:                             | 0018   |
| e. DOT/UN Proper Shipping Name:                  | AMMUNITION,<br>TEAR-PRODUCING                            |
| f. DOT Container Marking:                        | AMMUNITION,<br>TEAR-PRODUCING<br>UN 0018<br>PN 1360-SV-5 |
| g. Net Explosive Weight:                         | 0.762 kg<br>(1.68 pounds)                                |
| h. Net Propellant/Pyrotechnic<br>Weight:         | 0.0  |
| i. Net Explosive Weight for QD<br>Determination: | 0.762 kg<br>(1.68 pounds)                                |

2. Subject item must be packaged in accordance with 49 CFR  
173.62, packing method E-102 (Docket No HM 181A, dated 21 Dec  
90).

3. The above interim hazard classification is valid until 13  
March 1993 or until you obtain a final hazard classification,  
whichever occurs first.

SCBRD-ODR-S

SUBJECT: Interim Hazard Classification (ERDEC No. 93-19) for  
75 millimeter, Common Steel Shell, MK I

4. The above hazard classification has been issued in accordance with the procedures of TB 700-2 and authorized by 49 CFR 173.56(b)(2)(i). Each motor vehicle used to transport the above item must carry a copy of this hazard classification.

  
CAROL A. MASON  
Safety Engineer

CF:

Chairman, DOD Explosives Safety Board, ATTN: DDESB-KT, Hoffman  
Bldg 1, 2461 Eisenhower Avenue, Alexandria, VA 22331-0600  
Director, U.S. Army Technical Center for Explosives Safety,  
ATTN: SMCAC-EST, Savanna, IL 61074-9639



DEPARTMENT OF THE ARMY  
U.S. ARMY EDGEWOOD RESEARCH, DEVELOPMENT AND ENGINEERING CENTER  
ABERDEEN PROVING GROUND, MARYLAND 21010-5423



REPLY TO  
ATTENTION OF

25 JAN 1993

SCBRD-ODR-S (385-16a)

MEMORANDUM FOR Commander, U.S. Army Technical Escort Unit,  
ATTN: SMCTE-CO, Aberdeen Proving Ground,  
MD 21010-5423

SUBJECT: Interim Hazard Classification (ERDEC No. 93-20) for  
Livens Projectile

1. The following interim hazard classification has been issued  
for the subject item:

- a. DOD Hazard Class/Div/SCG: 1.1F
- b. DOT Hazard Class: 1.1F
- c. DOT Label: Explosive 1.1F
- d. UN Serial Number: 0167
- e. DOT/UN Proper Shipping Name: PROJECTILES
- f. DOT Container Marking: PROJECTILES  
UN 0167  
PN 1315-SV-J
- g. Net Explosive Weight: 0.095 kg  
(0.2094 pounds)
- h. Net Propellant/Pyrotechnic  
Weight: 0.0
- i. Net Explosive Weight for QD  
Determination: 0.095 kg  
(0.2094 pounds)

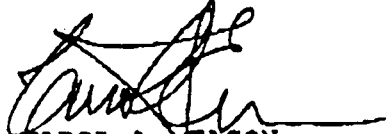
2. Subject item must be packaged in accordance with 49 CFR  
173.62, packing method E-106 (Docket No HM 181A, dated 21 Dec  
90).

3. The above interim hazard classification is valid until 13  
March 1993 or until you obtain a final hazard classification,  
whichever occurs first.

DR-S

: Interim Hazard Classification (ERDEC No. 93-20) for  
Projectile

above hazard classification has been issued in accordance  
with procedures of TB 700-2 and authorized by 49 CFR  
171.22(d)(2)(i). Each motor vehicle used to transport the above  
must carry a copy of this hazard classification.



CAROL A. EASON  
Safety Engineer

DOD Explosives Safety Board, ATTN: DDESB-KT, Hoffman  
2461 Eisenhower Avenue, Alexandria, VA 22331-0600  
U.S. Army Technical Center for Explosives Safety,  
AMCAC-EST, Savanna, IL 61074-9639

**APPENDIX VII**  
**LESSONS LEARNED**

**Rules of Engagement**

**Situation:** When I arrived on site, 11 Jan 93, the SRF did not have in place safety rules of engagement.

**Discussion:** The Commander's "rules of engagement" was not documented and distributed through out the SRF. These guidelines are useful for alerting personnel and ensuring they understand the mission priorities and guiding principles. It ensures the commander wishes are known yet, empowers personnel to be innovated and solve problems at the lowest level while keeping the command group informed.

**Recommendation:** Establish and publish the commander's rules of engagement earlier.

Gregory Mason  
Operation Safe Removal  
Special Staff  
27 Jan 93

## LESSONS LEARNED

### Department of Transportation Classification

**Situation:** Recovered unknown munitions must be transported off-site IAW DOT regulations.

**Discussion:** DOT regulation do not have a classification for unserviceable recovered suspect chemical agent filled munitions. DOT classification requirements are very specific about testing requirements prior to permitting the transport of hazardous material. Obsolete munitions do not have a valid hazard classification. Interim hazard classifications were issued to permit shipment of the munitions. This classification is actually for research quantities only.

**Recommendation:** Future efforts should be directed to obtaining special classifications (i.e., Ammunition, Recovered, Explosive; Ammunition, Recovered, Chemical; Ammunition, Recovered, Pyrotechnic) to eliminate the necessity of having to use the DOT experimental explosive section to effect the shipments.

Gregory Mason  
Operation Safe Removal  
Special Staff  
27 Jan 93



## LESSONS LEARNED

### Reporting of Monitoring Data

Situation: When I arrived on site on 11 Jan 93 monitoring data was being reported as ppm, mg/ $\mu\text{m}^3$ , and mg/g of dirt.

Discussion: The use of the different units to report reference data and monitoring results lead to initial delay and confusion in relating monitoring data to regulatory and health guidelines. Many permission exposure limits and Times weight average were given in mg/ $\text{m}^3$ , while EPA deals in ppm and ERDEC reports their findings in ppm.

Recommendation: Future efforts should either establish which units all data should be reported in, or report in both units.

Gregory Mason  
Operation Safe Removal  
Special Staff  
27 Jan 93

## LESSONS LEARNED

### Deployment of Resources

**Situation:** When I arrived on-site on 11 Jan 93 two assessment areas were not separated by the required intraline separation distance.

**Discussion:** To prevent propagation between explosive locations in the event of a explosive accident, the regulatory default distance (intraline) should be between each explosive location. Due to the site space limitation the minimum distance could not be maintained.

**Resolution:** A temporary fix was to employ brick left on site by the contractor as barricades between locations. These bricks were a possible secondary fragmentation hazards in case of an detonation. The problem was resolved by replacing the bricks with sand bags.

**Recommendation:** Ensure minimum intraline separation distances for low levels of explosive (less than 100 lbs) are established and maintained during deployment.

Gregory Mason  
Operation Safe Removal  
Special Staff  
27 Jan 93

### LESSONS LEARNED

Situation: When I reported on site, 11 Jan 93, MSDS were not available for all the known chemical surety agents.

Discussion: Most of TEU's responses are for suspect surety munitions. To properly assess the risk to TEU and civilian personnel, the TEU commander needs to know all pertinent data about the possible treats (i.e., health effects, TLV, PEL, etc) quickly.

Recommendation: TEU include MSDSs for all surety agents within their response kits.

Gregory Mason  
Operation Safe Removal  
Special Staff  
27 Jan 93

## LESSONS LEARNED

### Quick Reference Data Sheets

Situation: When I reported on site, 11 Jan 93, MSDSs or data was not available for all the known chemical ex-surety agents.

Discussion: Most of TEU's responses are for suspect chemical munitions. To properly assess the risk to TEU and civilian personnel, the TEU commander needs to know all pertinent data about the possible treats (i.e., health effects, TLV, PEL, etc). MSDS are suppose to be manufacture specific, are cluttered with a lot of interesting but extraneous data, and therefore should not be distributed.

Recommendation: Prepare quick reference data sheets for all ex-surety agents fills for inclusion within their response kits library.

Gregory Mason  
Operation Safe Removal  
Special Staff  
27 Jan 93

## LESSONS LEARNED

### Risk Management

Situation: The discussion maker had no bases for comparison of different types of risks.

Discussion: Much time was spent after development of the risk assessment discussing the relative risk of performing explosive munitions hazard assessment without 100% visual acuity vs the risk of the inhalation hazard associated with working unmasked. Was the inhalation hazard present greater than the risk of accidental explosion caused by decreased visual acuity resulting from wearing the protective mask during actual digging handling operations? A small loss of acuity could be a greater risk to the operator when handling suspect, armed, fuzed munitions than the chemical threat for specific conditions encountered. The temperature for the entire operation was below the freezing point for the main chemical surety treat.

Recommendation: Development of personnel protection decision tree based on risk assessments would provide the on-site commander initial minimum guidance for safe work practices.

Gregory Mason  
Operation Safe Removal  
Special Staff  
27 Jan 93

## LESSONS LEARNED

### Weight Given Random vs Bias Sample Results

Situation: Analytical results of specific suspect material "bias samples" (i.e., contains of a bottle; isolated clump of odd looking material; non-typical items) were used as the bases for early decisions to determine the most credible treat.

Discussion: Using bias sampling data as a bases for making decisions may have produced an inaccurate assessment of the work environment in the excavation area. While the bias sample data may be useful during the initial risk assessment, random sample results should be given greater weight as the operation proceeds. The details of bias sample taking (i.e., from a intact bottle) must be known to the decision maker so that he can give it the proper weight in the decision making process.

Recommendation: Make it a matter of policy that all bias sample results are reported separate from random sample results. Only results higher or approaching (within 2 orders of magnitude) either health or environmental action levels should be reported as positive.

Gregory Mason  
Operation Safe Removal  
Special Staff  
27 Jan 93

## LESSONS LEARNED

### Qualitative vs Quantitative Risk Assessments

Situation: Army risk assessment are traditionally qualitative, while federal EPA are quantitative.

Discussion: Assessment was based on the general risk of exposure to a acute hazard (was it toxicity; recommended respiratory protection based on TWA). Assessments do not weight risk IAW EPA assessments techniques to assign a numerical number of a event occurring (i.e., probability of 1/1,000,000 of getting cancer) which the discussion maker could use to base his choices. Use of this technique would provide for a smoother transition and provide continuity for into phase II.

Recommendation: Develop primary default numbers for expected future operations (1. expected inhalation exposure for digging; standing around; at hotline; etc; 2. expected dermal exposure for different protective clothing levels), for quick incorporation into future SRF site risk assessments.

Gregory Mason  
Operation Safe Removal  
Special Staff  
27 Jan 93

## LESSONS LEARNED

### Hot Line Discipline

Situation: Non TEU personnel became lacks during the later stages of the Operation.

Discussion: The TEU Commander and his officers did a excellence job of incorporating safety into their daily pre-operational briefing and operations. However, personnel not under the direct control of the TEU Commander were entering behind the hot line to perform needed functions and entered unauthorized areas.

Recommendation: Publication of the on-site Commander's policy should eliminate reoccurrences of this situation.

Gregory Mason  
Operation Safe Removal  
Special Staff  
27 Jan 93



## LESSONS LEARNED

### Hot Line Mobility

**Situation:** The hot line is intended to be mobile so that it can remain upwind in case of a wind shift in the event of an accident.

**Discussion:** Due to the large number of personnel it was required to be able to serve, and the length of the operations, the "hot line" was not and could not be moved to a upwind position. This inability to adjust would have eliminated it's capacity to serve it's function if the wind was from the south at the time of an accident. A resource that is not functional when needed is not a resource. TEU may have to respond to similar large recovery action, and it would be useful during response actions at APG-EA.

**Recommendation:** Provide TEU with a mobile four wheel drive custom van designed to contain and isolate the required decontamination stations.

Gregory Mason  
Operation Safe Removal  
Special Staff  
27 Jan 93

## LESSONS LEARNED

### On-site Showers Capability

Situation: There were no on-site facilities for the excavation workers to shower.

Discussion: There is a regulatory requirement for chemical agent worker performing operations in which there is a possibility that they may have been exposed to any concentration of chemical agent to shower before leaving the site. This requirement is to limit possible low level exposure which would not produce acute symptoms yet over a period of time may produce symptoms of chronic exposure. It also helps to limit possible spread of contaminants. Due to the low temperature (30-56° F) and lack of capability, the hot line decontamination shower was not a viable optimum.

Recommendation: Provide TEU with a mobile four wheel drive custom van/truck designed as a mobile clean area change/locker room. The vehicle must be able to provide heat and air conditioning and provide both hot and cold running water. Water recycling abilities are also required because TEU can not leave waste on site or return it to APG-EA.

Gregory Mason  
Operation Safe Removal  
Special Staff  
27 Jan 93

## LESSONS LEARNED

### On-site Detonation

**Situation:** Finding suspect fuzed armed munitions on-site that are unsafe to move.

**Discussion:** Although no munitions were found which fell into this category and discussions were held on site, the problem of having to destroy a chemical round in the middle of an large urban area should be addressed and researched to provide additional information to future on-site commanders.

**Recommendation:** A discission tree should be prepared based on quantitative risk assessments that address both explosive and health risk associated with the destruction of chemical munitions on-site. This document should be reviewed and concurred on by the surgeon general, DA legal, and federal EPA. Decision as to when to detonate it, length of time to wait for better weather condition (days, months, weeks,) on-site security, permitted activities near by pending detonation, ordering of methods of destruction should be addressed.

Gregory Mason  
Operation Safe Removal  
Special Staff  
27 Jan 93

## LESSONS LEARNED

### Fragmentation Hazard

**Situation:** After the departure of the chemical hazard, PINS testing, and packaging of HE rounds was still required.

**Discussion:** The commander wished to allow the home owner back into their houses ASAP. Using formulas from both TM 5-1300 and AR 385-64, a credible overpressure hazard zone was established based on the actual quantity of explosive present which would ensure the safety of the civilian population. However, only the regulatory default value (670' for 100 lbs or less) was available to base any fragmentation hazard decisions on. Long term evacuations has high visibility in urban areas. The ability to make better assumption would have increased the safety officers ability to provide a informed decision to the commander.

**Recommendation:** Develop a formula or chart which provides additional fragmentation separation distance default values for specific munitions or fill weights. Delineate actions (sandbagging area) which would reduce default values and what are acceptable reductions.

Gregory Mason  
Operation Safe Removal  
Special Staff  
27 Jan 93

## Decontamination Facility Improvements

Situation: TEU had to construct decontamination facilities in a field expedient manner.

Discussion: There are commercially available decontamination trailers that could be used by TEU for this type of operation. A trailer would much easier to set-up and would provide instant decon/shower capability on site. With the set-up at Spring Valley, the only shower capability would take place in the event of contamination. At that point point, casualties would be stripped and hosed down. A trailer would significantly improve conditions.

George Collins  
Operation Safe Removal  
Special Staff  
28 Jan 93

## Safety Officer On-site

Situation: TEU did not have a their safety officer on site until 10 Jan 93.

Discussion: TEU did not have their safety officer on-site until requested by the CBDA Safety representative. During this operation, the safety officer provided extremely valuable assistance on a daily basis and was instrumental in implementing an outstanding monitoring program for the site. His presence should always be part of any TEU deployment of this nature.

George Collins  
Operation Safe Removal  
Special Staff  
24 Jan 93

## Risk Assessment Completion Prior to Operations

Situation: TEU did not have a detailed risk assessment available before starting Operation Safe Removal.

Discussion: When I arrived at the site, 8 Jan 93, had not yet completed a risk assessment for this type of operation. Future efforts should be focused on doing risk assessments for every potential phase of an operation (i.e. munition removal, X-ray, decon, monitoring) of this magnitude. The risk assessments developed for this Operation Safe Removal should be updated and used as a starting point for future operations.

George Collins  
Operation Safe Removal  
Special Staff  
24 Jan 93

## SOPs On-site

Situation: TEU did not have a copy of their SOPs on site until 8 Jan 93.

Discussion: TEU did not have a copy of their SOP regarding recovery of unexploded ordnance on-site until requested by the CBDA Safety representative on 8 Jan 93. All applicable SOPs and regulations should be a part of what TEU brings to an operation of this nature. If this information is made available to all operators, there is a reduction in likelihood of deviation from these SOPs.

George Collins  
Operation Safe Removal  
Special Staff  
24 Jan 93



## Level of Protective Clothing

Situation: TEU made several improvements in the level of protective clothing being used for this operation.

Discussion: Through much analysis and discussion, TEU made improvements in the level of protective clothing worn for this operation. The level finally arrived at for this operation should be starting point for any further similiar operation. As each site will have its own inherent hazards, on-site risk assessments will always be needed to define the risk and recommend levels of protective clothing.

George Collins  
Operation Safe Removal  
Special Staff  
27 Jan 93

## Monitoring Support

Situation: TEU did not have the right level of monitoring equipment for this operation when they arrived on site 5 Jan 93.

Discussion: When the TEU arrived on-site their total monitoring capability included the M18A1, the CAM and the Viking analyzer. This equipment was not adequate to accurately monitor to low levels the array of chemicals potentially found at this site. During the operation, Edgewood RDEC, AEHA and the Corps of Engineers has provided on-site, lent, or given a wide range of monitoring equipment to support the operation. TEU should have the capability within the unit. Examples of equipment required:

- a. Real Time Analysis Platform
- b. Continuous oxygen and Lower Explosive Level sensing meters
- c. Carbon Monoxide monitors
- d. A wide array of Draeger detector tubes with associated pumps and sampling lines.

George Collins  
Operation Safe Removal  
Special Staff  
27 Jan 93

APPENDIX VIII  
CHRONOLOGY OF WORK

OPERATION SAFE REMOVAL

SAFETY JOURNAL - GEORGE COLLINS + GREG MAS

11 JAN 93

10745 KICK OFF MTG W/ KENISON

a. SCHEDULE OF DAILY MTGS

0800 - KENISON MTG W/ STAFF

1700 - KENISON MTG W/ STAFF

1800 - BG FRIEL MTG W/ PUBLIC

b. ACTION JOURNAL BEING KEPT BY STACY

c. STAFF PHONE # 282-2445 / CALL-IN # 282-06

d. Concept of OPERATION SAFE REMOVAL (SPRING VALLE  
MUNITIONS RECOVERY)

(1) LIQUID FILL MOVE BY AIR IAW DOT RULES. TCU  
WILL ESCORT TO ANDREWS THEN PBA.

(2) EXPLOSIVE FILL MOVED BY AIR IAW ~~DOT~~ DOT RULES.  
EOD ESCORT TO FT. BELVOIR

(3) SCRAP METAL MOVE BY TRUCK IAW HAZ. WASTE  
RULES BY HAZ. WASTE CONTRACTOR TO  
APPROVED LANDFILL OR APX (ER)

e. DETAILED TIMELINES DISCUSSED. PLAN IS TO CLEAR  
SITE BY FRIDAY.

f. TODAY'S TASKS FOR SAFETY:

DEVELOP RISK ASSESSMENT FOR PPC+E AND  
CHEMICAL <sup>AGENT</sup> HAZARD - BY NOON

0845 CONTACTED T. BLADES TO GET ARRIVAL

TIME ON RTAP - WILL LEAVE AT 1200

PER DISCUSSION - MINICAM WILL NOT BE USED.

ACAMS + HP ARE EQUIPMENT OF CHOICE

1230 - COMPLETED RISK ASSESSMENT. MADE DETERMINATION THAT IF A LEAKING ROUND IS FOUND, IT IS PROBABLE THAT SERIOUS INJURY WILL OCCUR. RISK ASSESSMENT GIVEN TO LT. COL BATT. HIS DECISION IS TO CONTINUE OPERATIONS WITHOUT MASK WORN

1400 - RISK ASSESSMENT WITH LT. COL BATT'S SIGNATURE PROVIDED TO BG FRIEL.

1600 - CONTACTED AEHA ON GETTING IH SAMPLING EQUIPMENT FOR CK, PHOSGENE, CHLOROPICRIN, WILL CALL BACK.

1700 ~~DATA~~ RECEIVED CALL FROM COL EVENDON (AEHA) WAS GIVEN POC JOHN RESTA. CAN HAVE EQUIPMENT BY NOON 12 JAN 93.

12 JAN 93

0800 PERFORMED EXPLOSIVE SAFETY EVALUATION OF SITE. RTAP SET UP TO MONITOR LEWISITE IN HOLE & BUBBLE MONITOR FOR MUSTARD

0945 AEHA ARRIVED AT SITE. BROUGHT SAMPLING EQUIPMENT FOR CK, PHOSGENE. ORDERED ADDITIONAL TUBES/ PUMPS TO INCLUDE CHLOROPICRIN. TEU WAS INSTRUCTED ON USE AND TUBES WERE PLACED ON SITE. ADDITIONALLY BREATHING ZONE SAMPLING

WITH DAMMS TUBES. MUSTARD IS THE TARGET AGENT.

1330 ORDERED 100 COPIES OF PHOSGENE, LEWISITE  
AND MUSTARD FOR PAO.

1400 MET TO DISCUSS ~~DECON~~ DISPOSITION OF DECONNED  
MATERIALS. TERRI MANN HAS ACTION TO DRAW-UP  
PROPOSAL FOR RECORD OF DECISION

1430 MET TO DISCUSS DISPOSITION OF SOIL SAMPLES.  
ALL WILL BE SCREENED FOR MUSTARD/LEWISITE  
BOTH BY HEAD SPACE + SOIL EXTRACTION.  
SPLIT SAMPLES WILL BE ANALYZED AS  
FOLLOWS:

ERDEC: MUSTARD, LEWISITE

AEHA: CYANIDE, PHOSGENE, CHLOROPICRIN, RIC

TOTAL METALS, SEMI VOLATILES

EPA: TOTAL METALS, SEMI VOLATILES

AEHA POC IS JOHN RESTIS:

DISCUSSED ORDERING GP SMALL + HEATER W/ K. BO  
WILL BE USED BY TEL TO MONITOR POC + E TO XXX.  
EXPECT TO HAVE BY 0900 13 JAN 93.

13 JAN 93

0800 COLK. MTG

- ESTABLISHED JOURNAL FORMAT FOR "LESSONS LEARNED"

- FORMAT: TITLE IN CAPS

SITUATION:

LESSON:

- GOAL TODAY: GET ONE LOAD OUT.

- LOOK AT SCRAP METAL MONITORING STATUS.

0930 CONTACTED AEHA TO RESOLVE NUMEROUS QUESTIONS REGARDING SOIL SAMPLE ANALYSIS

1030 WORKED NUMEROUS SAFETY RELATED TRANSPORTATION ISSUES. CONTACTED ANDREWS AFB SAFETY TO GET UNDERSTANDING OF THEIR PROBLEMS. MAIN CONCERNS: OVERPACK LEAKAGE AND EXPLOSIVE COMPATIBILITY BY THE END OF DAY (AND MANY CALLS) ISSUES WERE RESOLVED.

1300 SPENT MOST OF AFTERNOON OBTAINING INFO TO DEVELOP INTERIM HAZARD CLASSIFICATION FOR THE MATERIAL TO BE SHIPPED. THOSE COMPLETED INCLUDE CHEMICAL PROJECTILES: 75mm, LIVINS, 4.7

1430 DISCUSSED WITH DA SAFETY THE RESULTS OF RISK ASSESSMENT, PPE & E, MONITORING AND SHIPMENT GIVEN OK.

1530 DISCUSSED CERTIFICATION W/ MCNERNEY AT ERDEC.

14 JAN 93

0815 VERIFIED GP SMALL + STOVE ARRIVED ON SITE FOR MONITORING BAGGED CLOTHING.

0930 PROVIDED 3 ADDITIONAL INTERIM HAZARD CLASSIFICATIONS TO THE TRANSPORTATION TEAM A TEL FOR 3.0" STOKES HE + 75 mm HE PRW. + 3' STOKES SA

1030 CONTACTED AEMA TO FIRM UP WHAT THEY ARE TO LOOK FOR IN EOK ANALYSIS. ESTABLISHED G. LATTIN AS POC FOR CHEMICAL AGENT SCREEN KEN WILLIAMS (671-2208) IS AEMA POC.

1045 G. MASON + SHELDON ORR PRE-OPED LOADING OF HELICOPTER WITH FORKLIFT.

1100 PRODUCE ~~PO~~ LIST OF POSSIBLE FILLS FOR BLADES TO PREPARE FOR DRILLING OPS AT CTF.

⑥

1300 PROVIDE SITE SPECIFIC INFO ON 3 ROUNDS TO BE DRILLED/SAMPLED TO ERDEC SAFETY. USED TO ASSIST IN PREPARATION OF SOPS/FACILITIES

1430 COORDINATED W/ LTCOL BATT ON HEATING BOX OPERATIONS FOR "3X" ROUNDS. ESTABLISHED REQUIREMENT TO WEAR MASK WHEN OPENING BOX

ALL DAY - MONITORED LOADING ~~OUR~~ OPERATIONS FROM EXPLOSIVE SAFETY STANDPOINT.

~~1530 RAY FATEZ (DA SAFETY) ARRIVED~~

1530 SPOKE TO RAY FATEZ <sup>(DA SAFETY)</sup> ON ADDITIONAL SAFETY QUESTIONS FOR BRIEF HE WAS TO ATTEND W/ MR. WALKER.

1600 SPOKE TO FRANK MARTIN (ERDEC) ABOUT PREPARING CHAMBER TO DRILL EXPL. CONFIGURED ROUNDS.

15 JAN 93

0900 TALK TO SHELDON ORR (TEU) ON REQUIREMENT TO REPORT EXPOSURE IF T. BLINDS SAMPLING IS CONFIRMED FOR CHEMICAL AGENTS.



1100 RAY PATZ (DA SAFETY) AND COMPANY ARRIVED ON SITE. SAFETY CONSIDERATIONS WERE BRIEFED. A TOUR OF SITE WAS PROVIDED. QUESTION ANSWERED. DISCUSSION ON T. BLADES DRILLING ROUND AT CTF OCCURRED. ~~DECISION~~ DECISION MADE TO INVITE DDFSB (DR. MAURITS) TO CTF AT 0700 ON 16 JAN 93.

1200 CONTACTED DR. MAURITS AND DISCUSSED CTF ISSUES. HE AGREED TO MEET 16 JAN 93.

1200 PROVIDED SAFETY INFO ON BROMO ACETON TO T. BLADES IN PREPARATION OF DRILLIA OPERATION

1315 MET W/ BG FRIEL ON RISK ASSESSMENT PROVIDE ASSESSMENT ON SIGNIFICANT RISK WE FACE BY NOT WEARING MASK. BOTH LTC BATT AND BG FRIEL SIGNED RISK ASSESSMENT AND WENT WITH LEVEL D (~~NO~~ MASK SLUNG) BG FRIEL DIRECTED AN UPDATE OF RISK ASSESSMENT WITH NEW MONITORING / PROTECTIVE CLOTHING CONSIDERATIONS. ECD 21 JAN 93.

21 JAN 93

0700 - 1030 MET WITH DDES (DR. MAURITS). DID TOUR OF SITE AND EXPLAINED SAFETY AND OCCUPATIONAL HEALTH PROVISIONS FOR THE OPERATION. REVIEWED RISK ASSESSMENT TO DATE. COMMENTS / CONCERNS WERE ADDED TO DOCUMENTS. SITE SAFETY CONCERNS (i.e. BRICKS AS BARRICADES, CK POLYMERIZATION, CO DETECTORS) WERE PASSED TO SHELDON ORR, TEL.

1300 PORTABLE ISOTOPIC NEUTRON SOURCE (PINS) SHOWED UP ON SITE TODAY. RAY MASTNJAK <sup>(RPO)</sup> DID RADIATION EVALUATION OF BOTH PINS AND TEL X-RAY SET-UP. BOTH PINS AND THE TEL X-RAY ARE PROPERLY SET-UP AND PRESENT NO RADIOLOGICAL HAZARD TO PERSONNEL. A PERIMETER LINE WAS SET UP APPROXIMATELY 25 FEET FROM THE NEUTRON SOURCE. RADIATION LEVELS AT THE PERIMETER LINE ARE WITHIN THE RANGE OF NORMAL BACKGROUND RADIATION.

1400 CONTINUED WORK ON <sup>CHEMICAL</sup> RISK ASSESSMENT FOR ESTABLISHMENT OF PROT. CLOTHING AND EQUIPMENT AND MONITORING FOR TEL.

1500 AEHA AUTOMATIC DETECTION TUBE PUMPS AND ADDITIONAL DETECTOR TUBES

ARRIVED ON SITE. THIS PROVIDES TEL WITH  
ADDITIONAL MONITORING CAPABILITY, EQUIPMENT

PROVIDED: 2 AUTOMATIC DETECTOR PUMPS: S/N: ADN 0194, S/N: ADN 0195  
2 HAND DETECTOR PUMPS: S/N: AREJ-F022, S/N: AREJ-F023  
2 BATTERY CHARGERS

22 JAN 93

0800

CONTINUED WORK ON RISK  
ASSESSMENT FOR TEL. ADDED DEU  
OF EXPLOSIVE RISK ASSESSMENT  
AS RECOMMENDED BY TEL.

1330

PERFORMED RADIATION SURVEY  
OF PINS.

23 JAN 93

ALL DAY CONTINUED WORK ON RISK ASSESSMENT

1500

PROVIDED FOLDER OF MSDS FOR TEL  
REVIEW UNDER PROVISIONS OF ~~OSHA~~ RIGHT  
TO KNOW.

ALSO DISCUSSED RISK ASSESSMENT ISSUES  
TO MAKE FINAL MODIFICATIONS.

TOURED PIT AREA W/ CO BATT.

24 JAN 93

WORKED RISK ASSESSMENT. PROVIDED  
COMPLETED ASSESSMENT TO TEL SAFETY  
AT 1630.

25 JAN 93

COMPLETED 8 ADDITIONAL INTERIM HAZARD  
CLASSIFICATIONS FOR SHIPMENT OF ROUNDS.  
THEY INCLUDED:

COMPLETED DRAFT "RULES OF ENGAGEMENT"  
FOR CG SIGNATURE.

MET W/ TEL SAFETY ON SHIPMENT OF  
RADIATION BADGES TO ERDEC FOR ANALYSIS

DEVELOPED AND STAFFED W/ TEL  
STAFF A CHRONOLOGY OF SAFETY  
IMPROVEMENTS FOR THE SITE.

DURING STAFF MTG W/ CG, CG MADE IT  
CLEAR THAT NO BURSTERED MUNITIONS  
WOULD GO TO THE CHEMICAL TRANSFER  
FACILITY. ALL MUNITIONS TO BE DRILLED  
WILL BE CERTIFIED FREE OF EXPLOSIVES

26 JAN 93

BEGAN PREPARING AFTER ACTION REPORT  
AND LESSONS LEARNED.

DISCUSSED RISK ASSESSMENT WITH <sup>LT</sup> COL BATT.

COMPLETED CHRONOLOGY OF SAFETY IMPROVEMENT  
TO THE SITE.

27 JAN 93

OBTAINED LTC BATT'S SIG ON RISK  
ASSESSMENT. SUBMITTED TO BG FRIEL  
FOR APPROVAL.

28 JAN 93

WORKED EXPLOSIVE QUANTITY DISTANCE ISSUES  
WITH LTC BATT ON CLEARING AREA FOR  
FRIDAY EVACUATION OF POPULATION.

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## Appendix IX

### List of Equipment to be Provided by SRF

1. Environmentally controlled work area
2. Desk and table
3. One chair per person assigned to the team.
4. Telephone with access to electronic mail.
5. Office supplies (i.e. file folders, file folder holders, pens, spiral notebooks,
6. Laser printer access
7. Copier with automatic feed
8. FAX machine

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## Appendix X

### List of Personal Equipment/References to be Brought by Safety Consultant

#### Personal Equipment

1. Laptop computer with printer
2. Software (i.e. Wordperfect, Procomm)
3. Office Supplies (i.e. spiral notebook, file folders  
etc.)
4. Safety Equipment (i.e. Hearing Protection, Safety  
Shoes, Protective Mask, Protective Eyewear)
5. Warm Clothes!!

#### References

1. OSHA 1910 and 1960
2. AR 385-61 and DA PAM 385-61
3. AMCR 385-100
4. Chemical Agent Material Safety Data Sheets
5. Risk Assessment Code Descriptions (MIL-STD-882B)
6. DA PAM 40-173
7. DA PAM 40-8
8. AR 385-64
9. TMs 5-1300, 9-1300-214
10. SB 742-1
11. AMCR 385-21
12. 49 CFR (Transportation)
13. DA Safety Personnel Phone Book

Blank

## Appendix XI

### Key Personnel Contacts

1. Carol Eason - Edgewood RDEC Safety - Interim Hazard Classifications - (410) 671-2290
2. Ray Mastnjak - Edgewood RDEC Safety - Radiation Protection - (410) 671-2471
3. John Resta - AEHA - Soil/Air Monitoring Equipment - (410) 671-3651
4. John Rankin - AMC Safety - (703) 274-9475
5. Ken Williams - AEHA - Lab Analysis - (410) 671-2208
6. Dr. Bill Maurits - DODESB Chemical Safety - (703) 325-0891/8624
7. Ray Fatz - DA Safety - (703) 695-7291
8. Greg Mason - ERDEC Safety - Explosive Safety - (410) 671-2415
9. George Collins - ERDEC Safety - Chemical Safety - (410) 671-4412
10. Elaine Sander - ERDEC Safety - Chemical History - (410) 671-2546
11. Jef Franchere - ERDEC Safety - Risk Assessment - (410) 671-2528

AMSCB-CO (385 (A))

25 Jan 93

MEMORANDUM FOR DIRECTOR, OPERATIONS

SUBJECT: SRC Reuse Policy/Procedures

1. Reference. Memorandum, PM SRC, 24 Jan 93, Subject: SAB
2. The SRF safety Office concurs with the SRC Program Manager's assessment and criteria.
3. The point of contact for this action is Greg Mason, ERDEC, DSN 584-2415/4411.

*Gregory O. Mason*  
GREGORY O. MASON  
SRF Safety Officer

24 Jan 93

MEMORANDUM FOR DIRECTOR, OPERATIONS

SUBJECT: SRC Reuse Policy/Procedures

1. The single sound containers (SRC-155, SRC-8inch, SRCX & SRCXX) are approved for reuse when the following criteria has been observed:

a. All SRC's shall be decontaminated after use.

b. Draft DA Pam 385-61 shall provide the guidance for establishing the decontamination levels and record keeping of such decontamination (i.e. DD Form 2271).

c. Each container decontaminated for reuse shall have a copy of DD Form 2271 forwarded to Commander, ERDEC, ATTN: SCBRD-ENE (J. McNerney), Aberdeen Proving Ground, MD 21010-5423, with the following data:

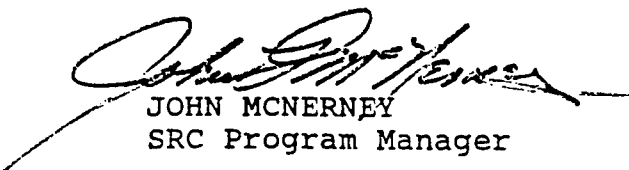
- (1) DD Form 2271 tab number.
- (2) Container serial number.
- (3) Date of decontamination.
- (4) Container status (3x, 5x).

d. Used gasket material shall be removed from the SRC, prior to decontamination, and discarded in accordance with local requirements.

e. New gasket material shall be installed at the time of reuse.

f. All containers designated for reuse, shall be shipped to Commander, U.S. Army Technical Escort Unit, ATTN: Sharon Hoffman, Aberdeen Proving Ground, MD 21010-5423, for evaluation, leak testing and re-certification.

2. The point of contact for this action is the undersigned, ERDEC/SCBRF-ENE-SSP, DSN 584-3605/3357.

  
JOHN MCNERNEY  
SRC Program Manager